FIG.1

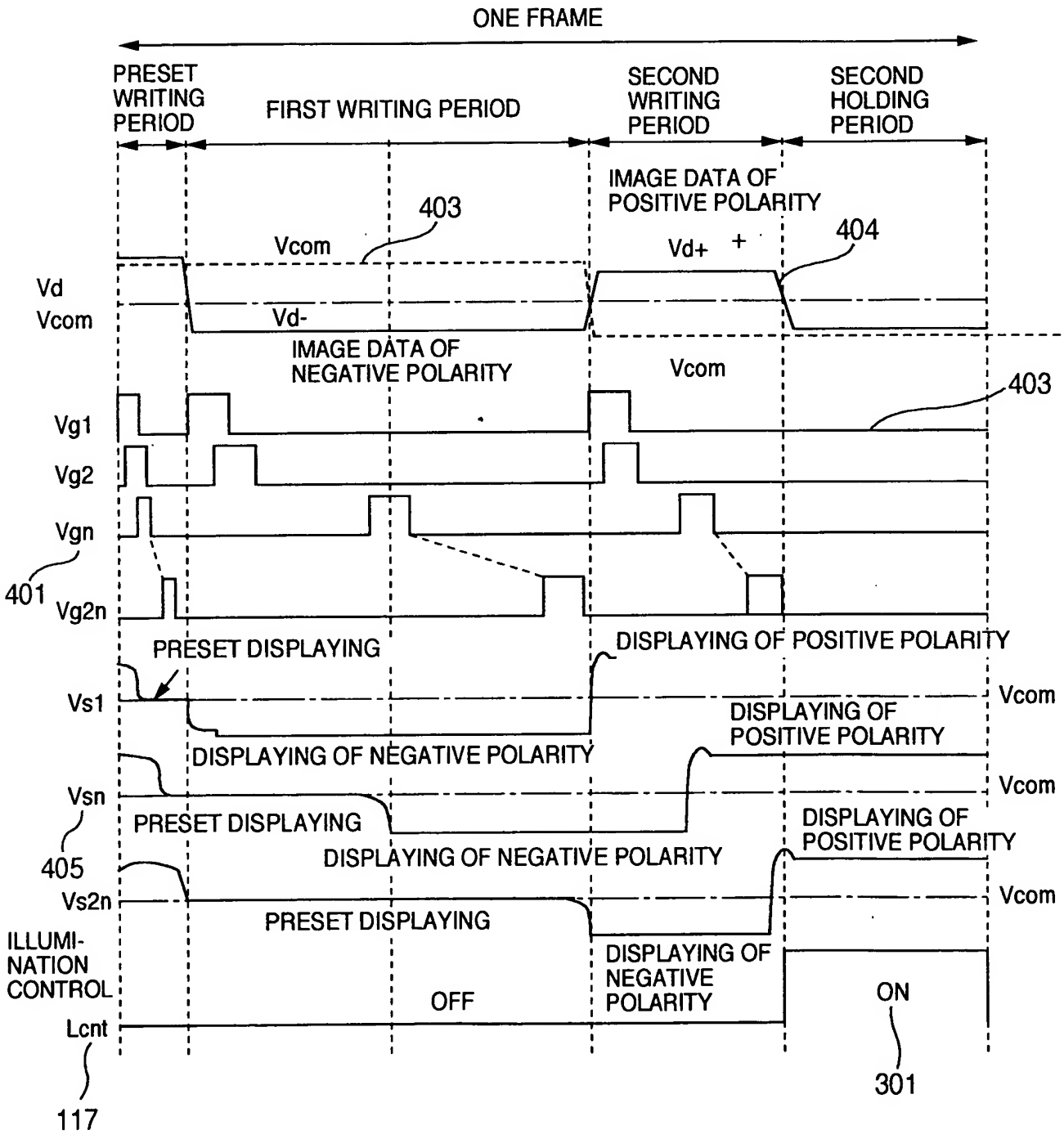

ONE FRAME
PRESET WRITING PERIOD
FIRST WRITING PERIOD
SECOND WRITING PERIOD
SECOND HOLDING PERIOD
IMAGE DATA OF POSITIVE POLARITY
403
404
Vcom
Vd+
Vd
Vcom
Vd-
IMAGE DATA OF NEGATIVE POLARITY
Vcom
403
Vg1
Vg2
Vgn
401
Vg2n
PRESET DISPLAYING
DISPLAYING OF POSITIVE POLARITY
Vs1
Vcom
DISPLAYING OF POSITIVE POLARITY
DISPLAYING OF NEGATIVE POLARITY
Vsn
Vcom
PRESET DISPLAYING
DISPLAYING OF POSITIVE POLARITY
405
DISPLAYING OF NEGATIVE POLARITY
Vs2n
Vcom
PRESET DISPLAYING
ILLUMI-NATION CONTROL
DISPLAYING OF NEGATIVE POLARITY
OFF
ON
Lcnt
301
117

FIG.2A

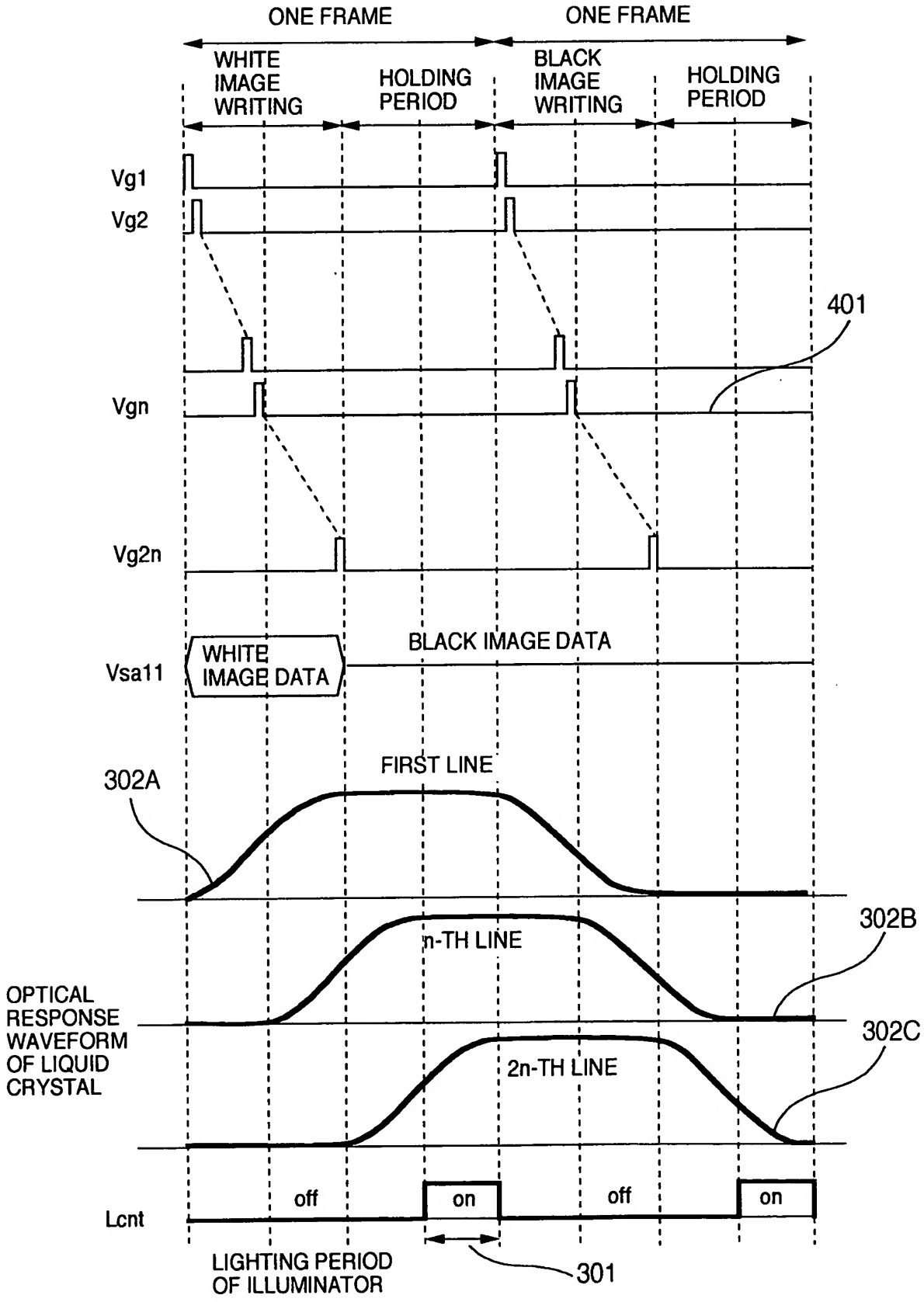

ONE FRAME
ONE FRAME
WHITE IMAGE WRITING
HOLDING PERIOD
BLACK IMAGE WRITING
HOLDING PERIOD
Vg1
Vg2
401
Vgn
Vg2n
Vsa11
WHITE IMAGE DATA
BLACK IMAGE DATA
302A
FIRST LINE
n-TH LINE
302B
OPTICAL RESPONSE WAVEFORM OF LIQUID CRYSTAL
2n-TH LINE
302C
Lcnt
off
on
off
on
LIGHTING PERIOD OF ILLUMINATOR
301

FIG.2B

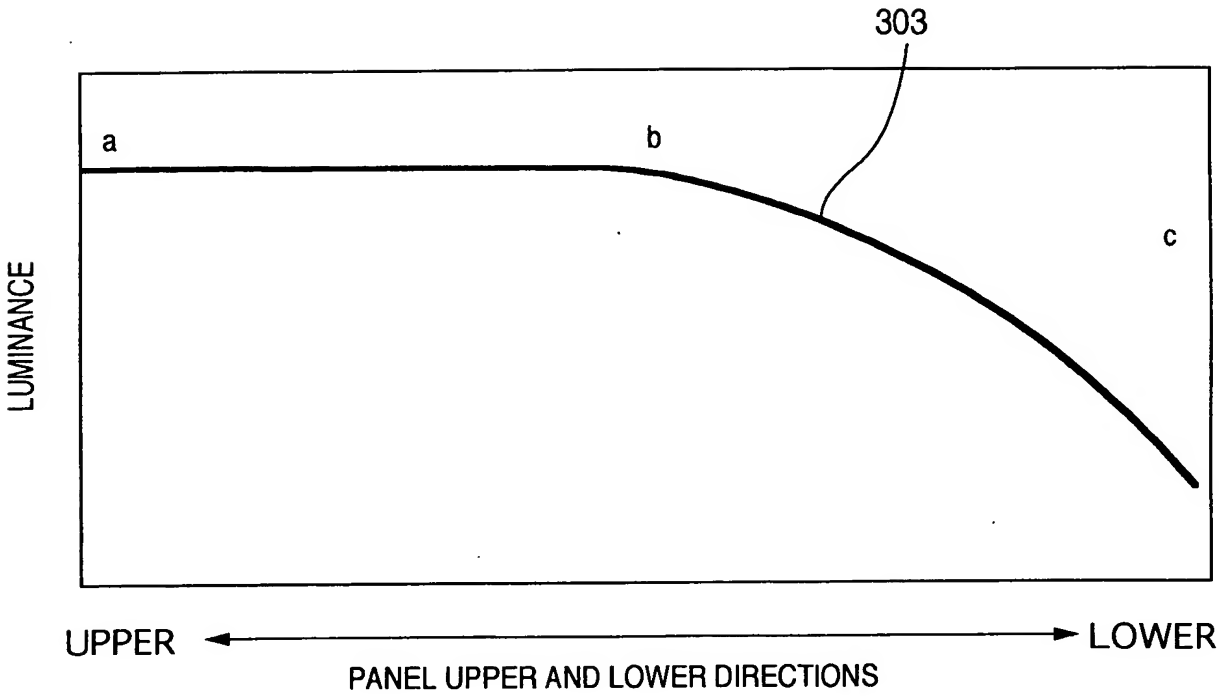

303
a
b
c
LUMINANCE
UPPER
LOWER
PANEL UPPER AND LOWER DIRECTIONS

FIG.3

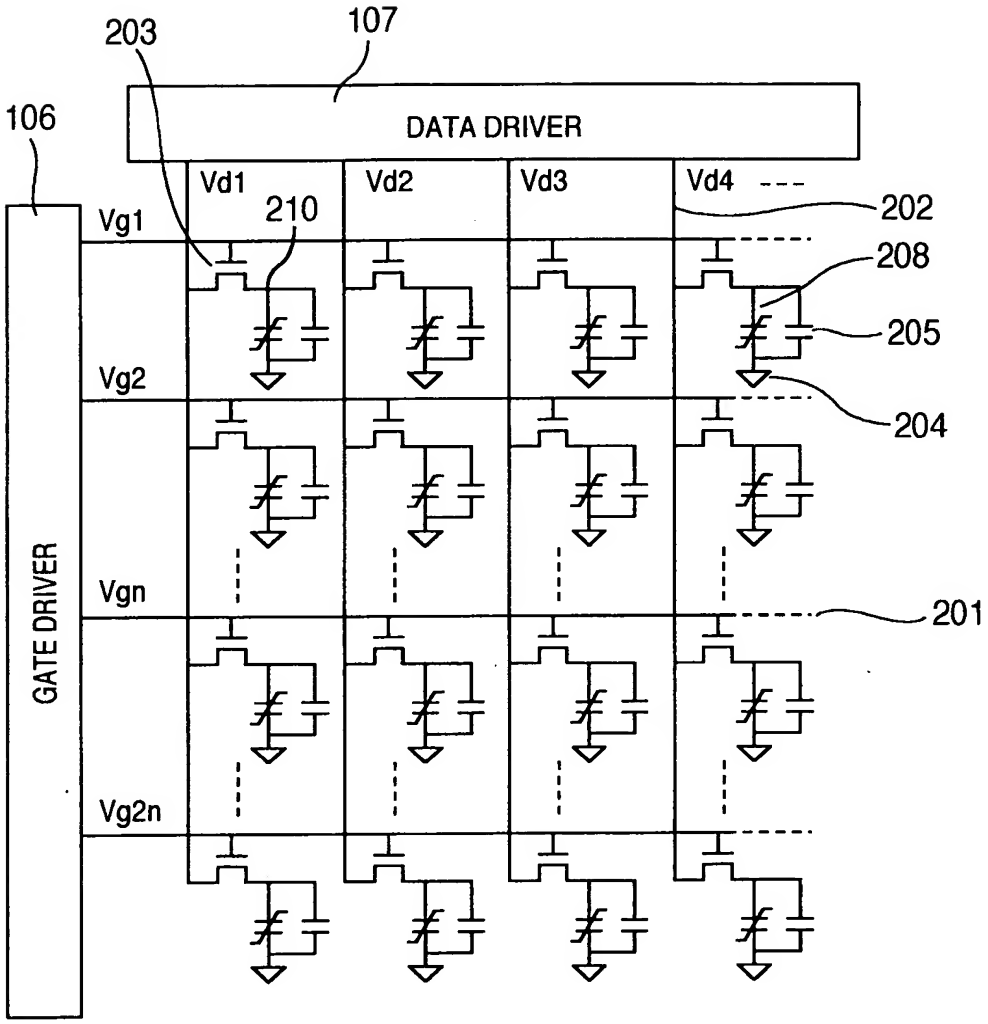
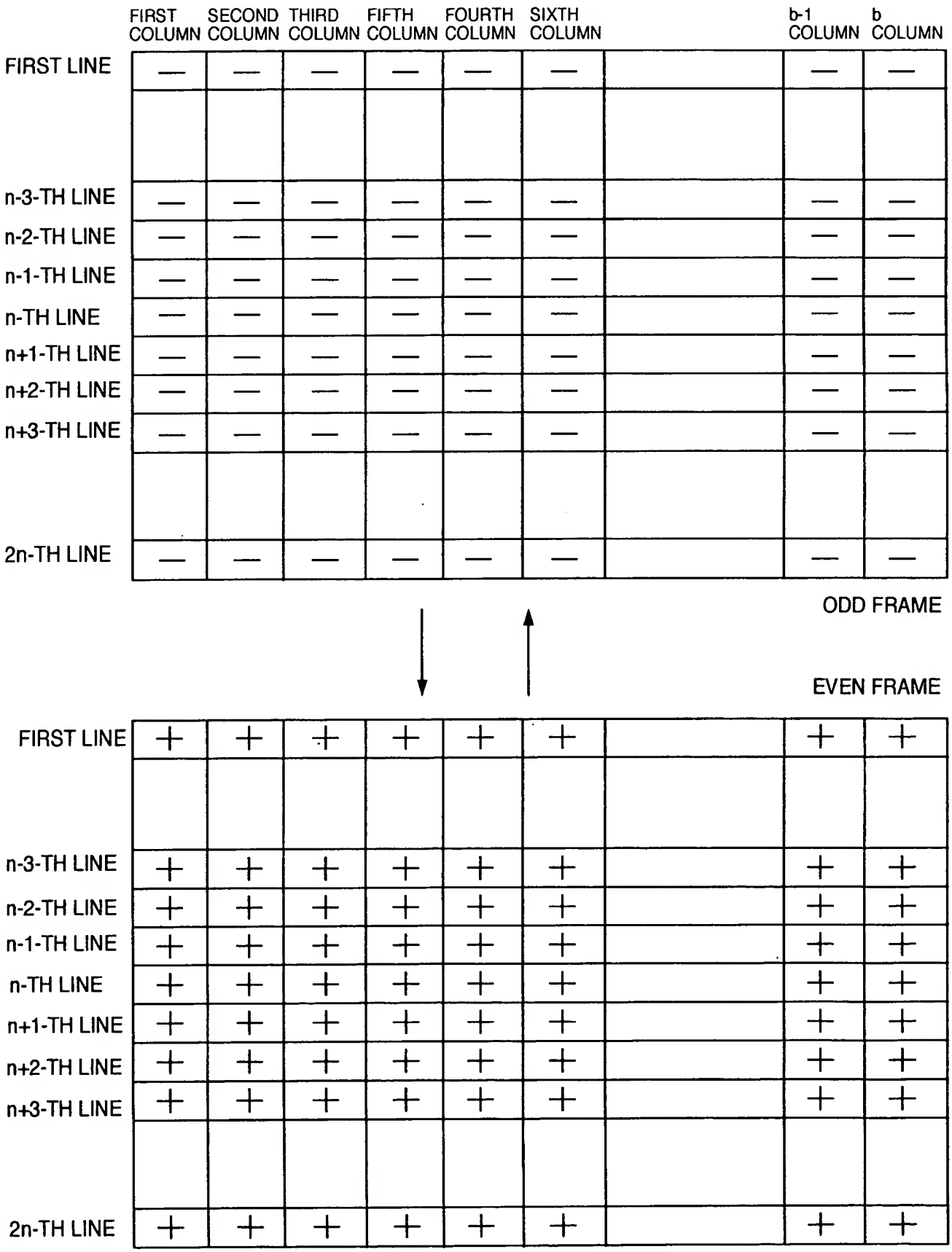

203
107
106
DATA DRIVER
Vd1
Vd2
Vd3
Vd4
210
202
208
205
Vg1
Vg2
204
Vgn
201
GATE DRIVER
Vg2n

FIG.4A



20050504.165600T

2067E0 "4656007

FIG.4B

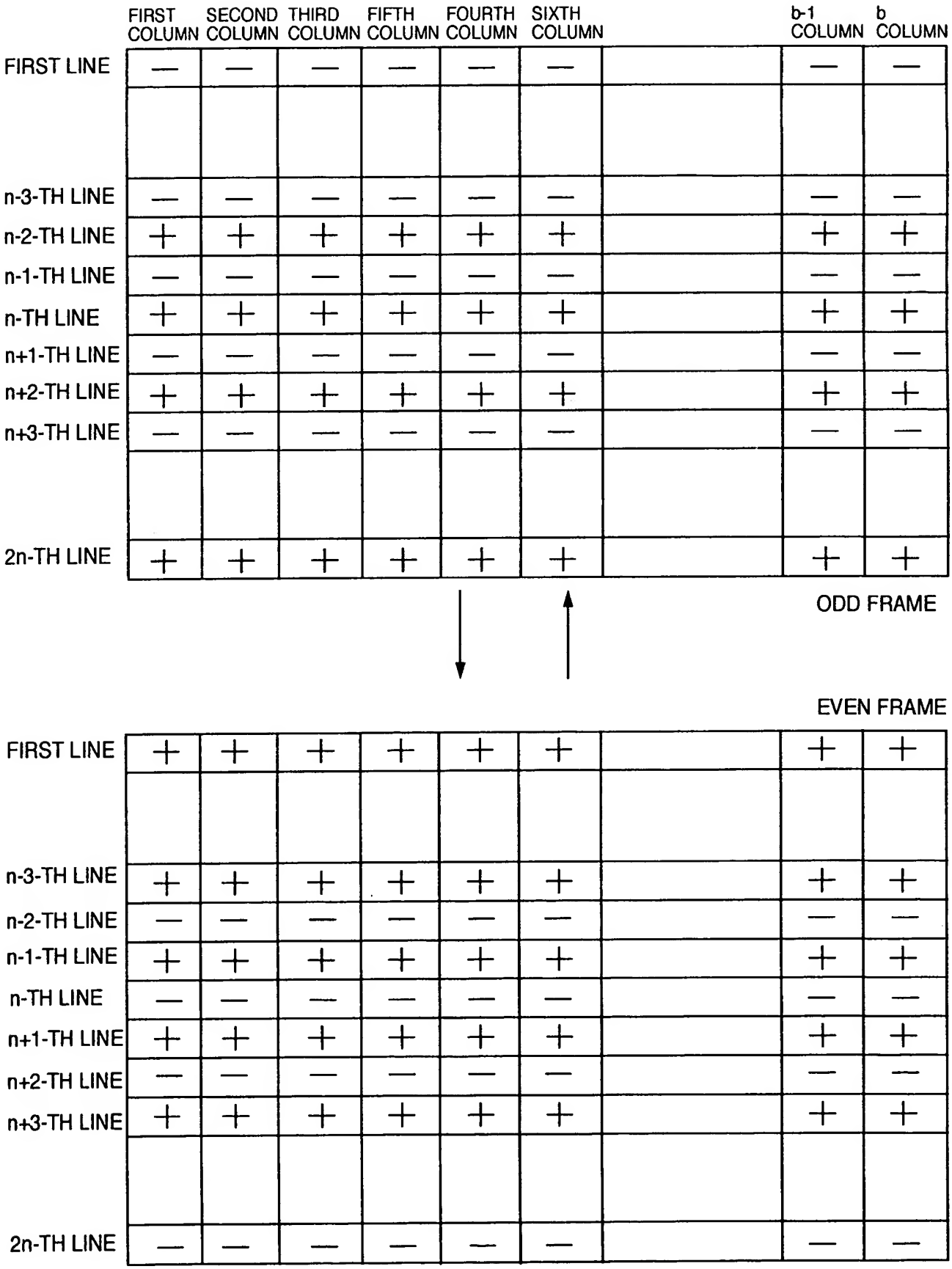


FIG.4C

	FIRST COLUMN	SECOND COLUMN	THIRD COLUMN	FIFTH COLUMN	FOURTH COLUMN	SIXTH COLUMN		b-1 COLUMN	b COLUMN
FIRST LINE	—	+	—	+	—	+		—	+
a-3-TH LINE	—	+	—	+	—	+		—	+
a-2-TH LINE	—	+	—	+	—	+		—	+
a-1-TH LINE	—	+	—	+	—	+		—	+
a-TH LINE	—	+	—	+	—	+		—	+
a+1-TH LINE	—	+	—	+	—	+		—	+
a+2-TH LINE	—	+	—	+	—	+		—	+
a+3-TH LINE	—	+	—	+	—	+		—	+
2a-TH LINE	—	+	—	+	—	+		—	+

ODD FRAME

EVEN FRAME

FIRST LINE	+	—	+	—	+	—		+	—
a-3-TH LINE	+	—	+	—	+	—		+	—
a-2-TH LINE	+	—	+	—	+	—		+	—
a-1-TH LINE	+	—	+	—	+	—		+	—
a-TH LINE	+	—	+	—	+	—		+	—
a+1-TH LINE	+	—	+	—	+	—		+	—
a+2-TH LINE	+	—	+	—	+	—		+	—
a+3-TH LINE	+	—	+	—	+	—		+	—
2a-TH LINE	+	—	+	—	+	—		+	—

2057650 "4656004

FIG.4D

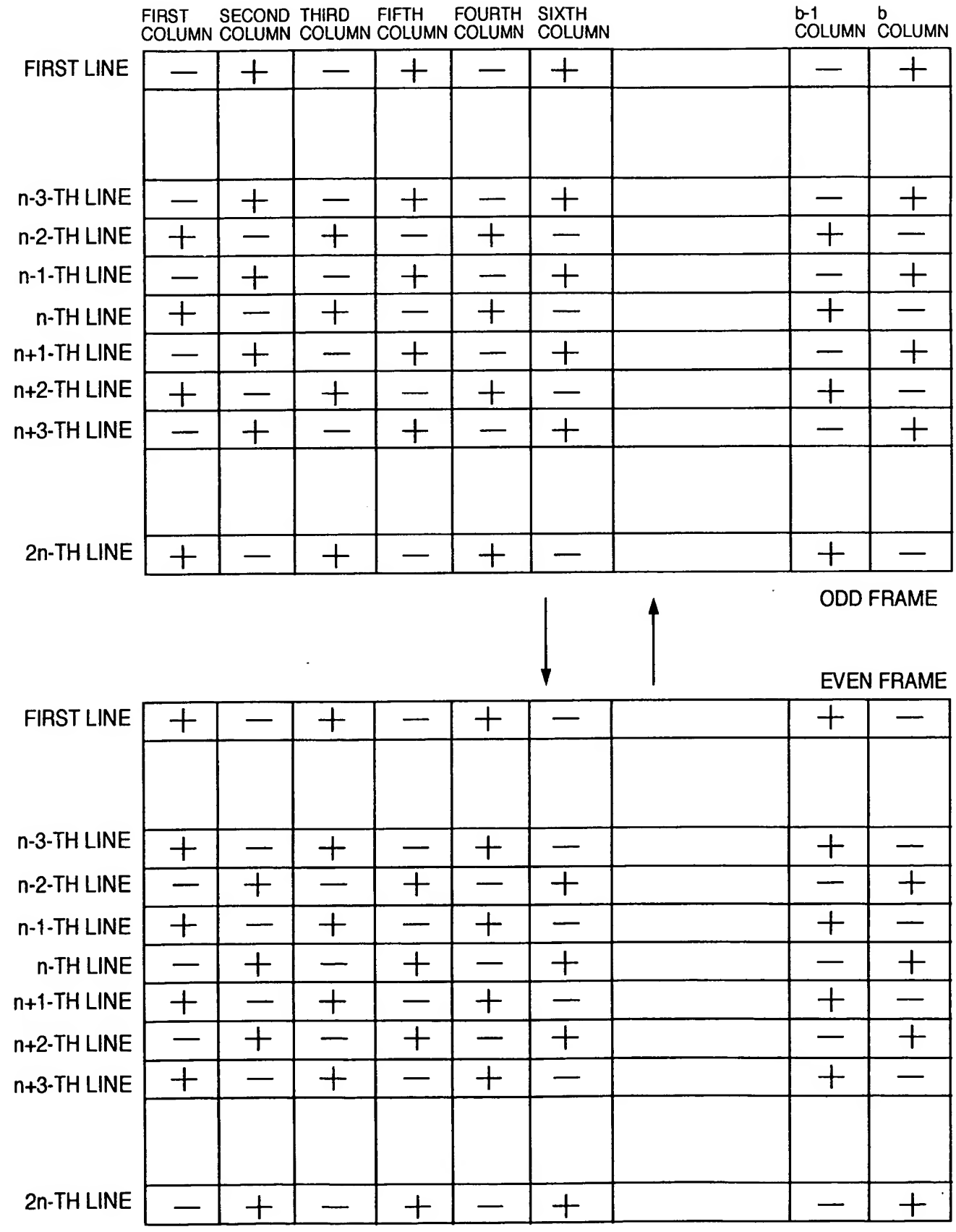

FIRST COLUMN
SECOND COLUMN
THIRD COLUMN
FIFTH COLUMN
FOURTH COLUMN
SIXTH COLUMN
b-1 COLUMN
b COLUMN
FIRST LINE
n-3-TH LINE
n-2-TH LINE
n-1-TH LINE
n-TH LINE
n+1-TH LINE
n+2-TH LINE
n+3-TH LINE
2n-TH LINE
ODD FRAME
EVEN FRAME

FIG.5

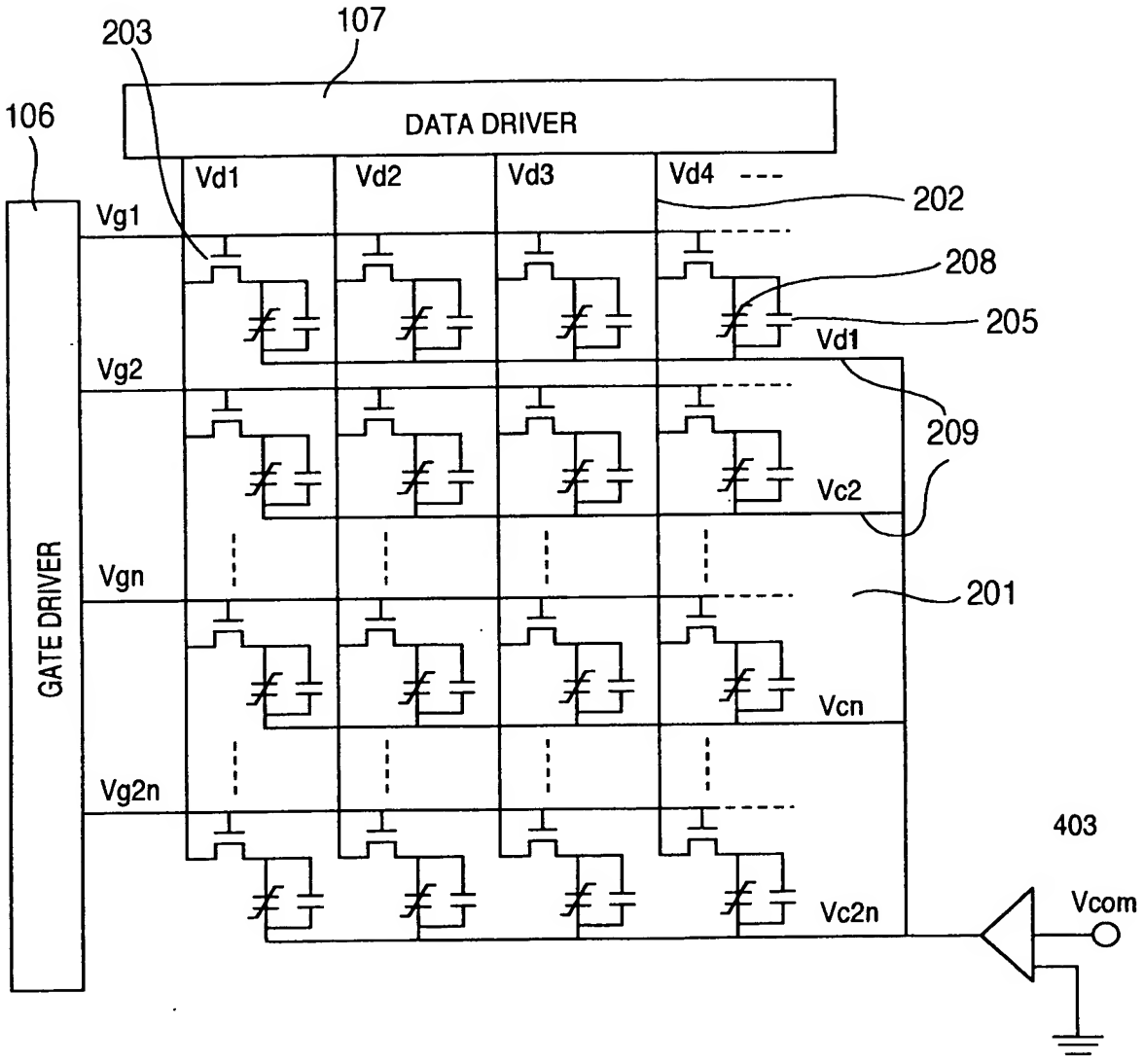

203
107
106
DATA DRIVER
Vd1
Vd2
Vd3
Vd4
202
Vg1
208
205
Vd1
Vg2
209
Vc2
GATE DRIVER
Vgn
201
Vcn
Vg2n
403
Vcom
Vc2n

FIG.6

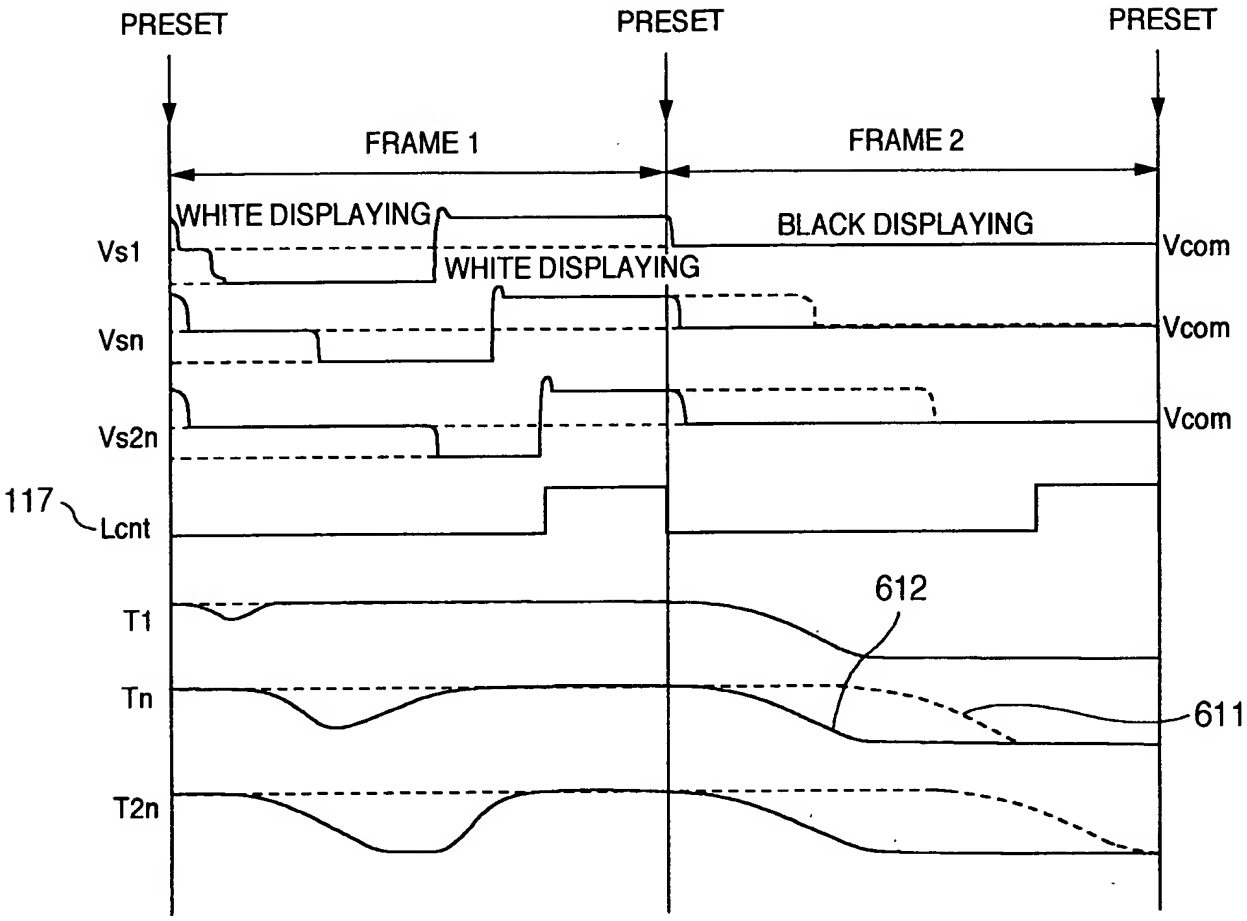

PRESET
PRESET
PRESET
FRAME 1
FRAME 2
WHITE DISPLAYING
BLACK DISPLAYING
Vs1
WHITE DISPLAYING
Vcom
Vsn
Vcom
Vs2n
Vcom
117
Lcnt
612
T1
Tn
611
T2n

FIG.7

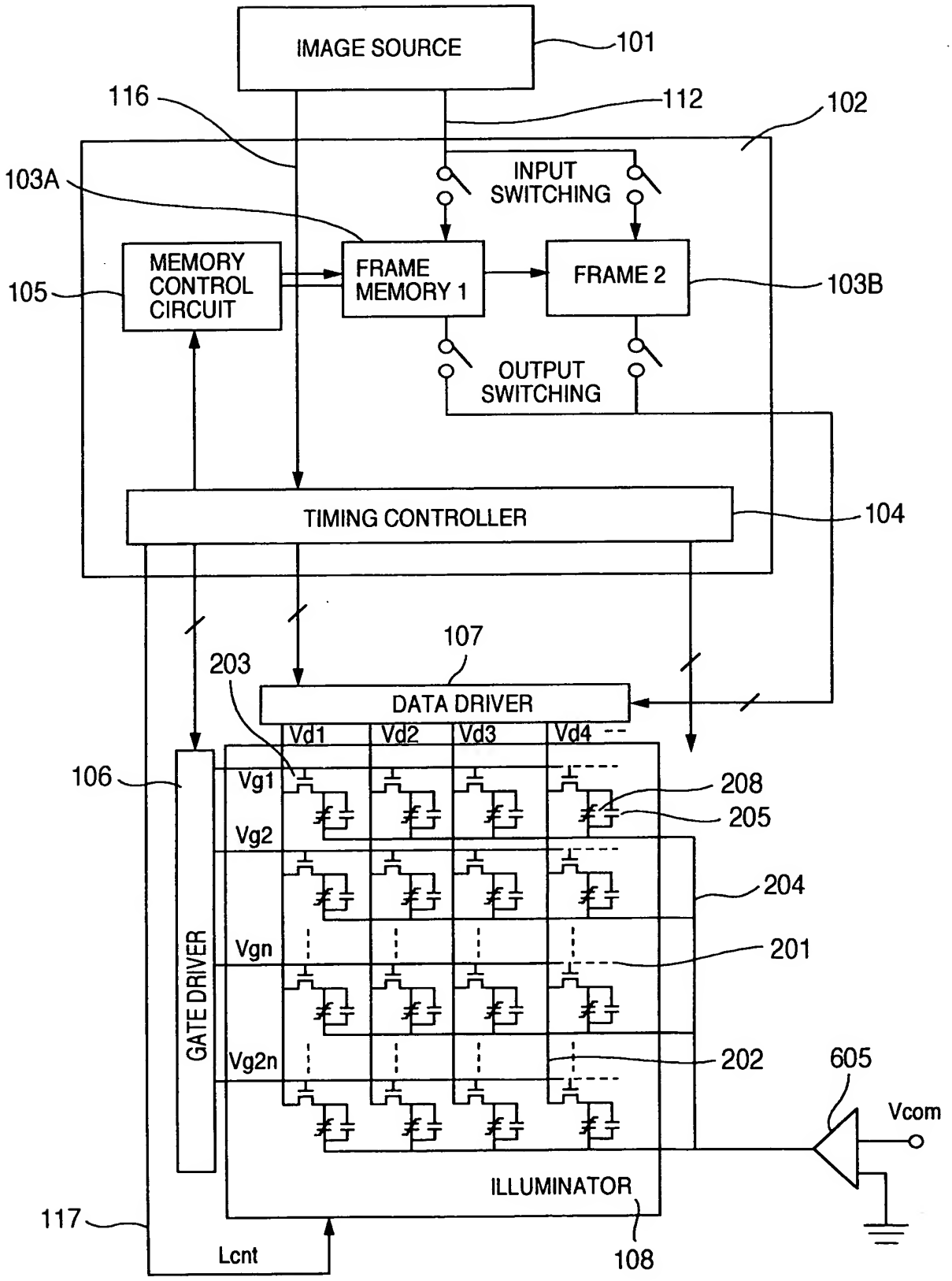


IMAGE SOURCE
101
116
112
102
103A
INPUT SWITCHING
MEMORY CONTROL CIRCUIT
105
FRAME MEMORY 1
FRAME 2
103B
OUTPUT SWITCHING
TIMING CONTROLLER
104
107
203
DATA DRIVER
Vd1
Vd2
Vd3
Vd4
106
Vg1
208
205
Vg2
204
Vgn
201
GATE DRIVER
Vg2n
202
605
Vcom
ILLUMINATOR
117
Lcnt
108

FIG.8

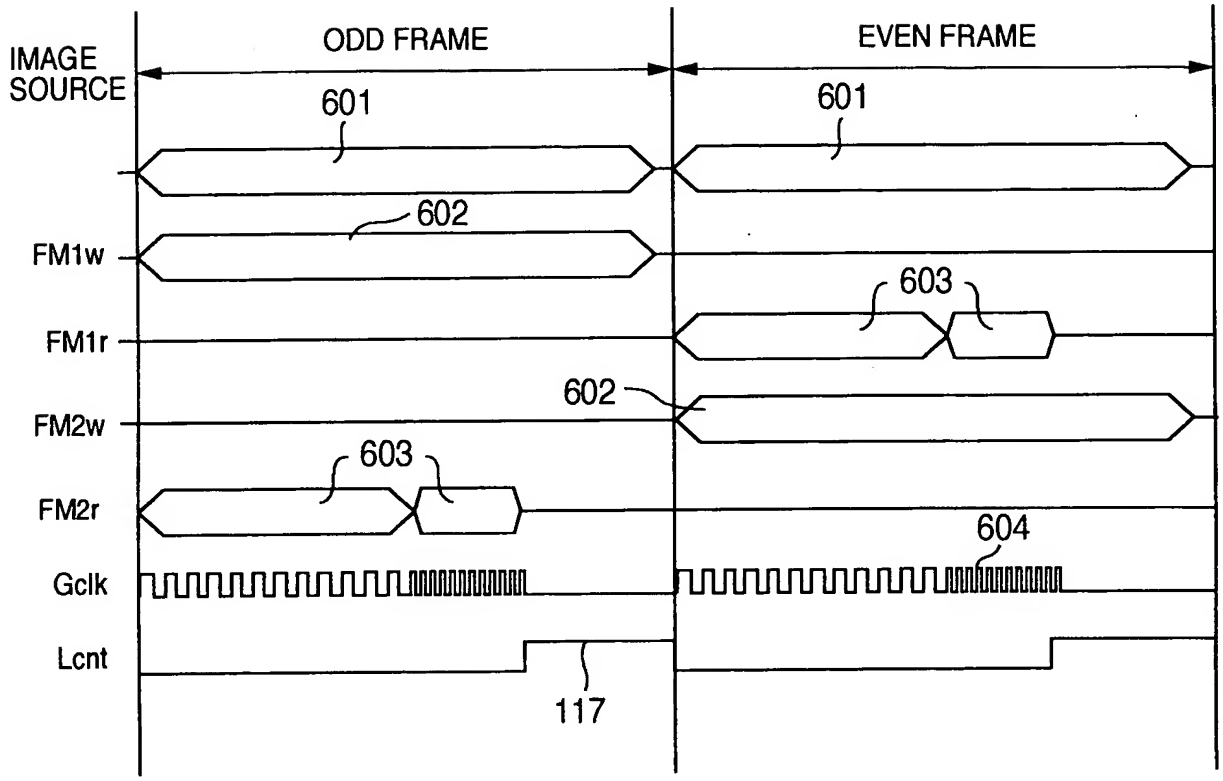


IMAGE SOURCE
ODD FRAME
EVEN FRAME
601
601
602
FM1w
603
FM1r
602
FM2w
603
FM2r
604
Gclk
Lcnt
117

FIG.9

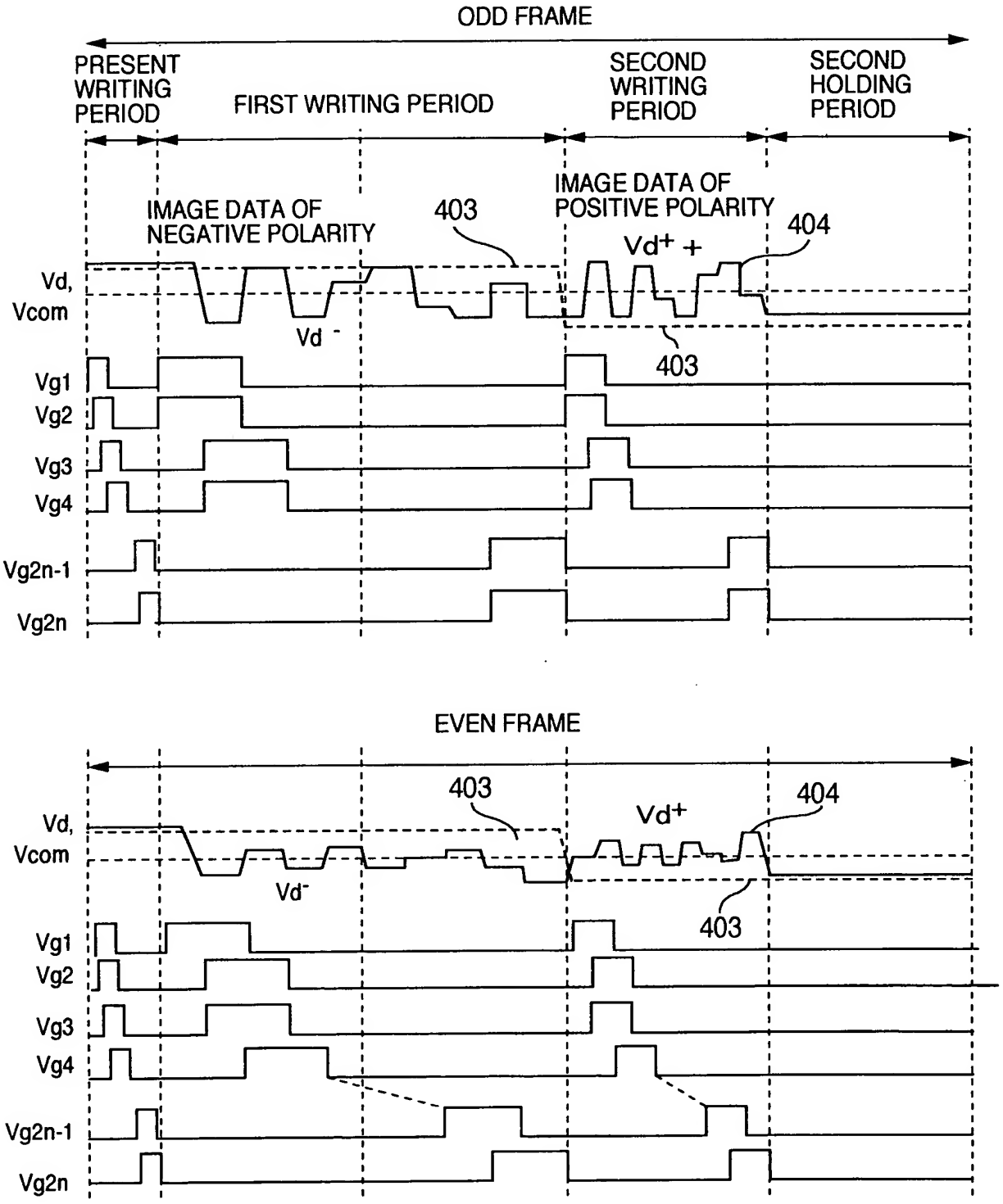

ODD FRAME
PRESENT WRITING PERIOD
FIRST WRITING PERIOD
SECOND WRITING PERIOD
SECOND HOLDING PERIOD
IMAGE DATA OF NEGATIVE POLARITY
403
IMAGE DATA OF POSITIVE POLARITY
404
Vd+ +
Vd, Vcom
Vd -
403
Vg1
Vg2
Vg3
Vg4
Vg2n-1
Vg2n
EVEN FRAME
403
Vd+
404
Vd, Vcom
Vd-
403
Vg1
Vg2
Vg3
Vg4
Vg2n-1
Vg2n

FIG.10A

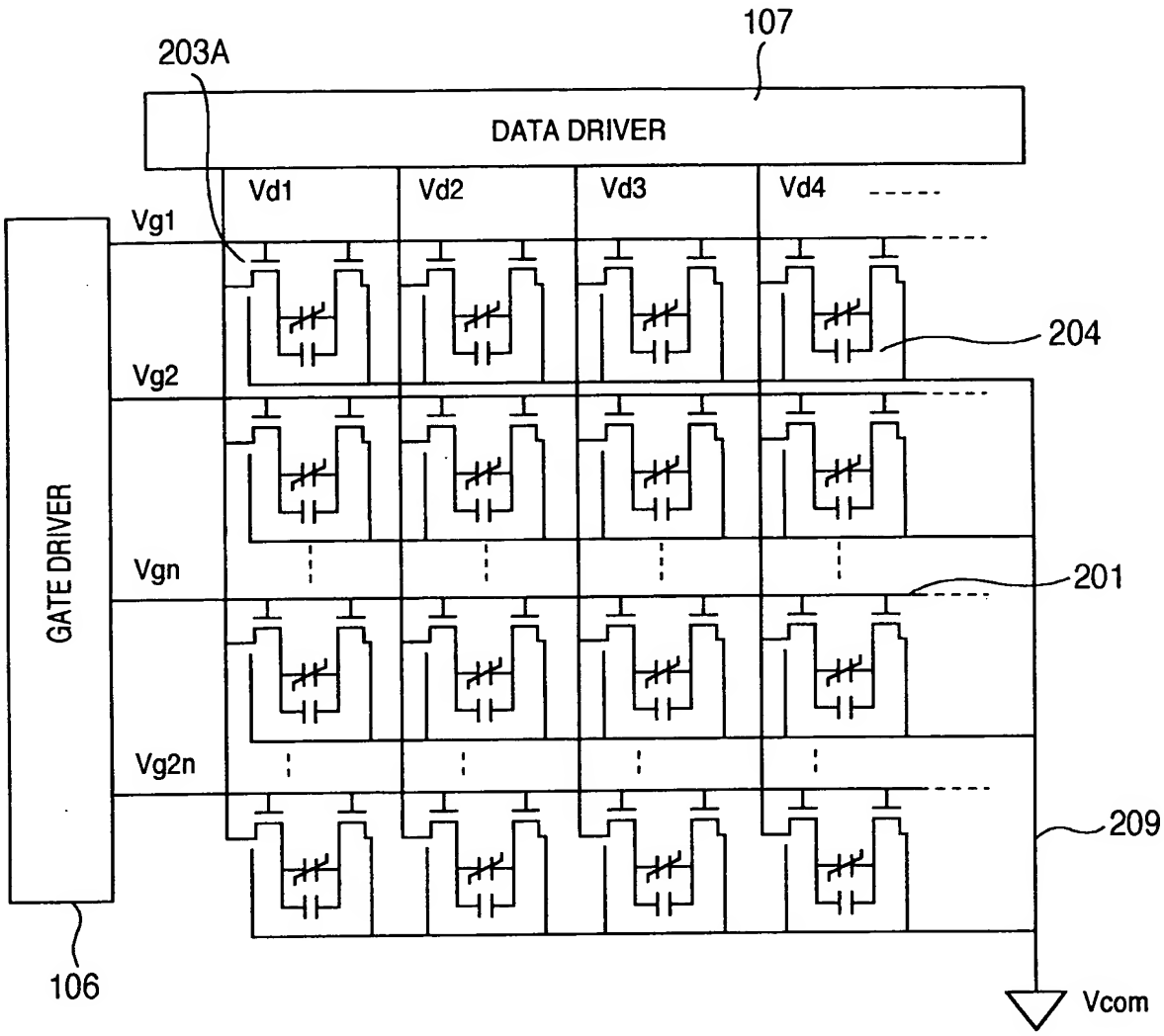

107
203A
DATA DRIVER
Vd1
Vd2
Vd3
Vd4
Vg1
Vg2
Vgn
Vg2n
GATE DRIVER
204
201
209
106
Vcom

FIG.10B

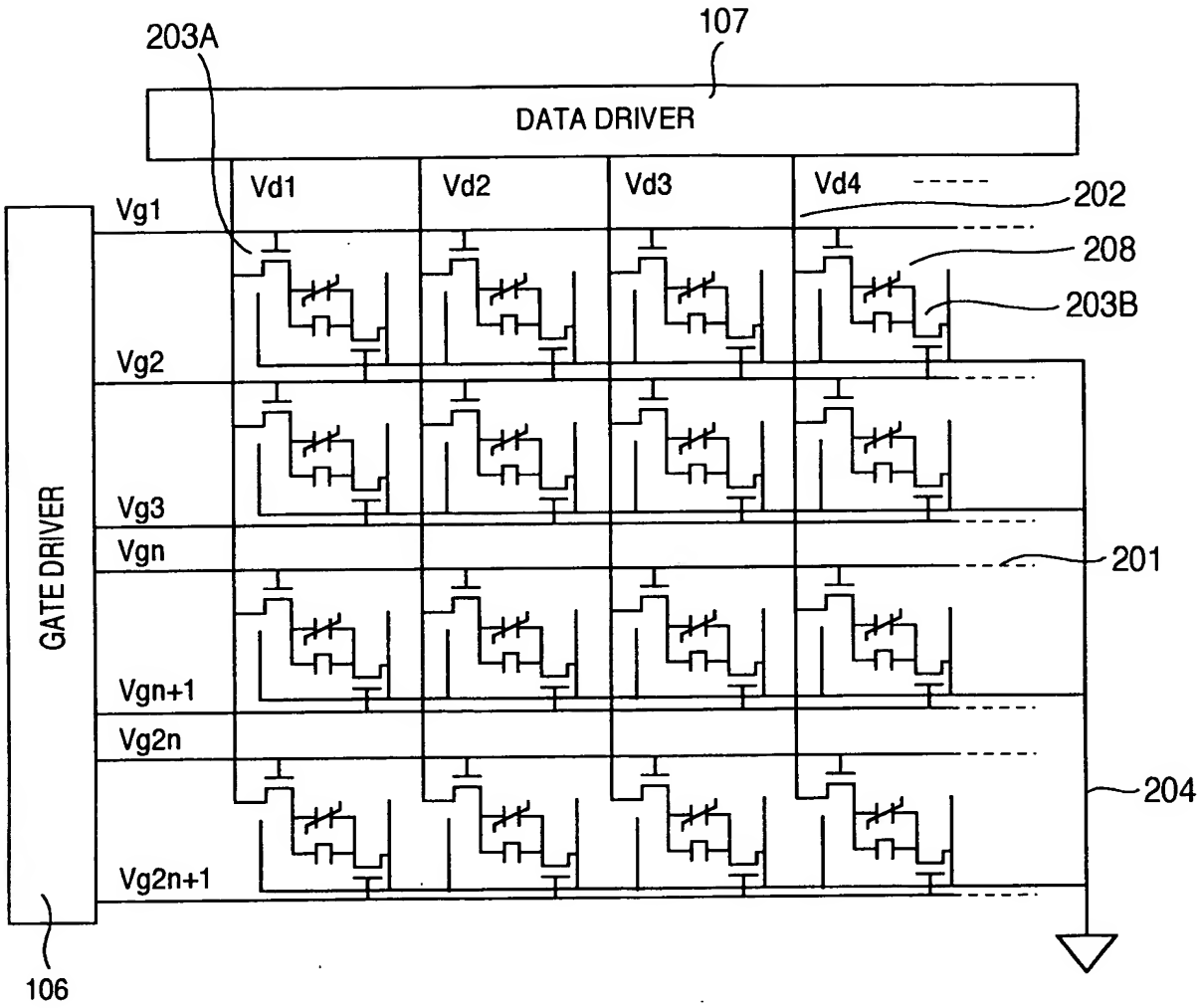

203A
107
DATA DRIVER
Vd1
Vd2
Vd3
Vd4
202
208
203B
Vg1
Vg2
Vg3
Vgn
Vgn+1
Vg2n
Vg2n+1
GATE DRIVER
201
204
106

FIG.11

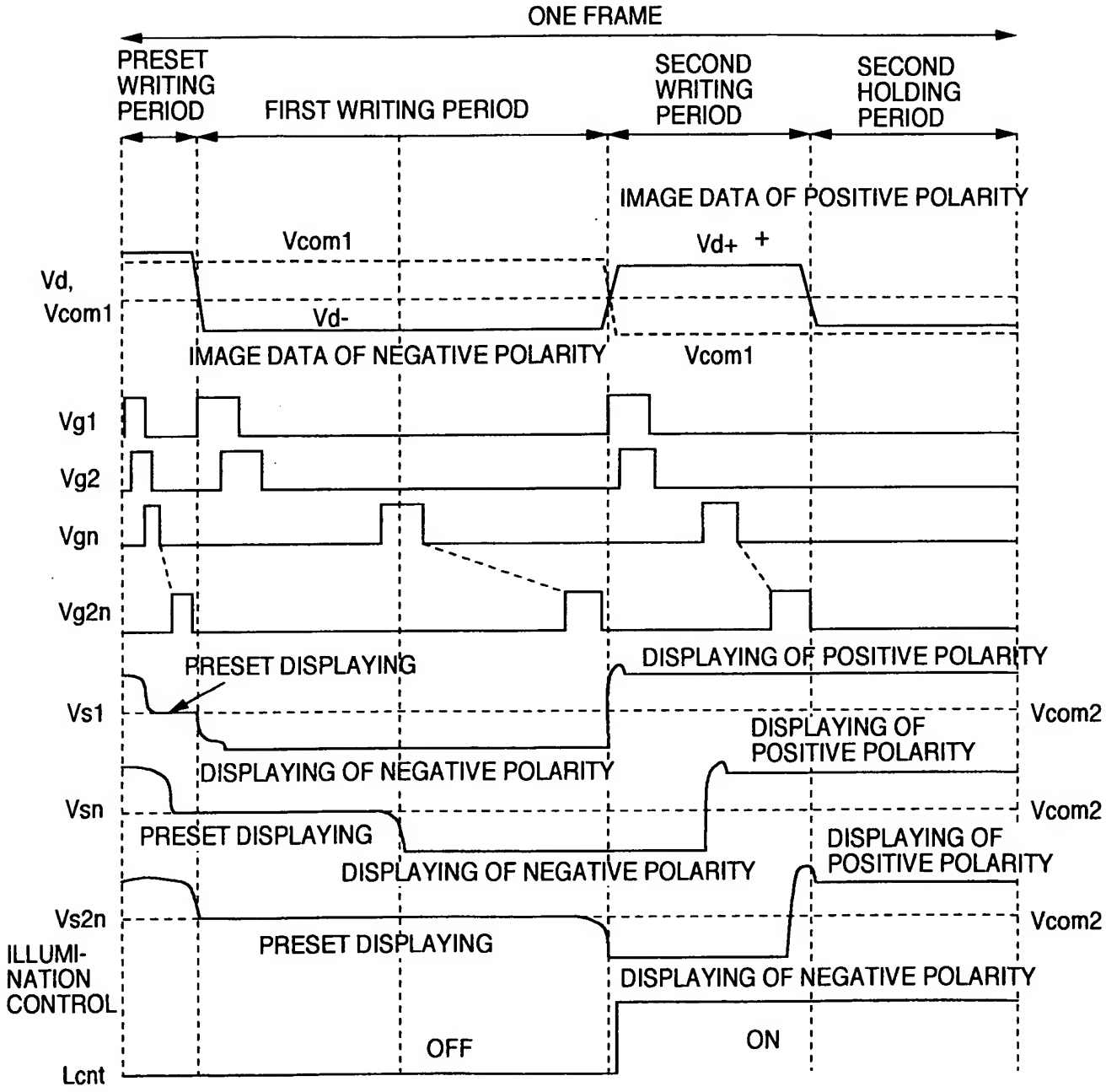

ONE FRAME
PRESET WRITING PERIOD
FIRST WRITING PERIOD
SECOND WRITING PERIOD
SECOND HOLDING PERIOD
IMAGE DATA OF POSITIVE POLARITY
Vcom1
Vd+ +
Vd,
Vcom1
Vd-
IMAGE DATA OF NEGATIVE POLARITY
Vcom1
Vg1
Vg2
Vgn
Vg2n
PRESET DISPLAYING
DISPLAYING OF POSITIVE POLARITY
Vs1
Vcom2
DISPLAYING OF POSITIVE POLARITY
DISPLAYING OF NEGATIVE POLARITY
Vsn
Vcom2
PRESET DISPLAYING
DISPLAYING OF POSITIVE POLARITY
DISPLAYING OF NEGATIVE POLARITY
Vs2n
Vcom2
PRESET DISPLAYING
ILLUMI-NATION CONTROL
DISPLAYING OF NEGATIVE POLARITY
OFF
ON
Lcnt

FIG.12

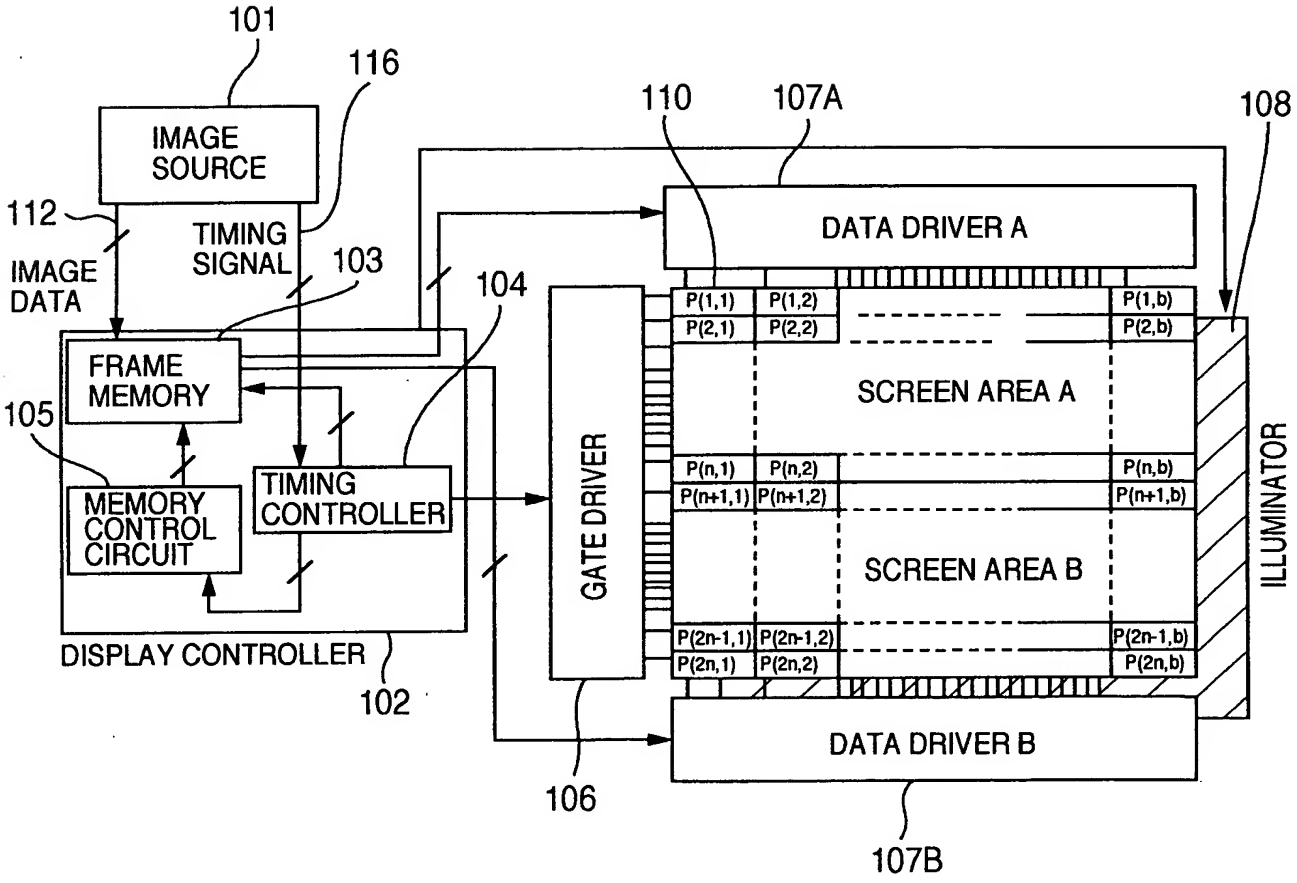

101
116
110
107A
108
IMAGE SOURCE
112
TIMING SIGNAL
IMAGE DATA
103
104
DATA DRIVER A
FRAME MEMORY
105
MEMORY CONTROL CIRCUIT
TIMING CONTROLLER
GATE DRIVER
P(1,1)
P(1,2)
P(1,b)
P(2,1)
P(2,2)
P(2,b)
SCREEN AREA A
P(n,1)
P(n,2)
P(n,b)
P(n+1,1)
P(n+1,2)
P(n+1,b)
SCREEN AREA B
ILLUMINATOR
P(2n-1,1)
P(2n-1,2)
P(2n-1,b)
P(2n,1)
P(2n,2)
P(2n,b)
DISPLAY CONTROLLER
102
DATA DRIVER B
106
107B

FIG.13

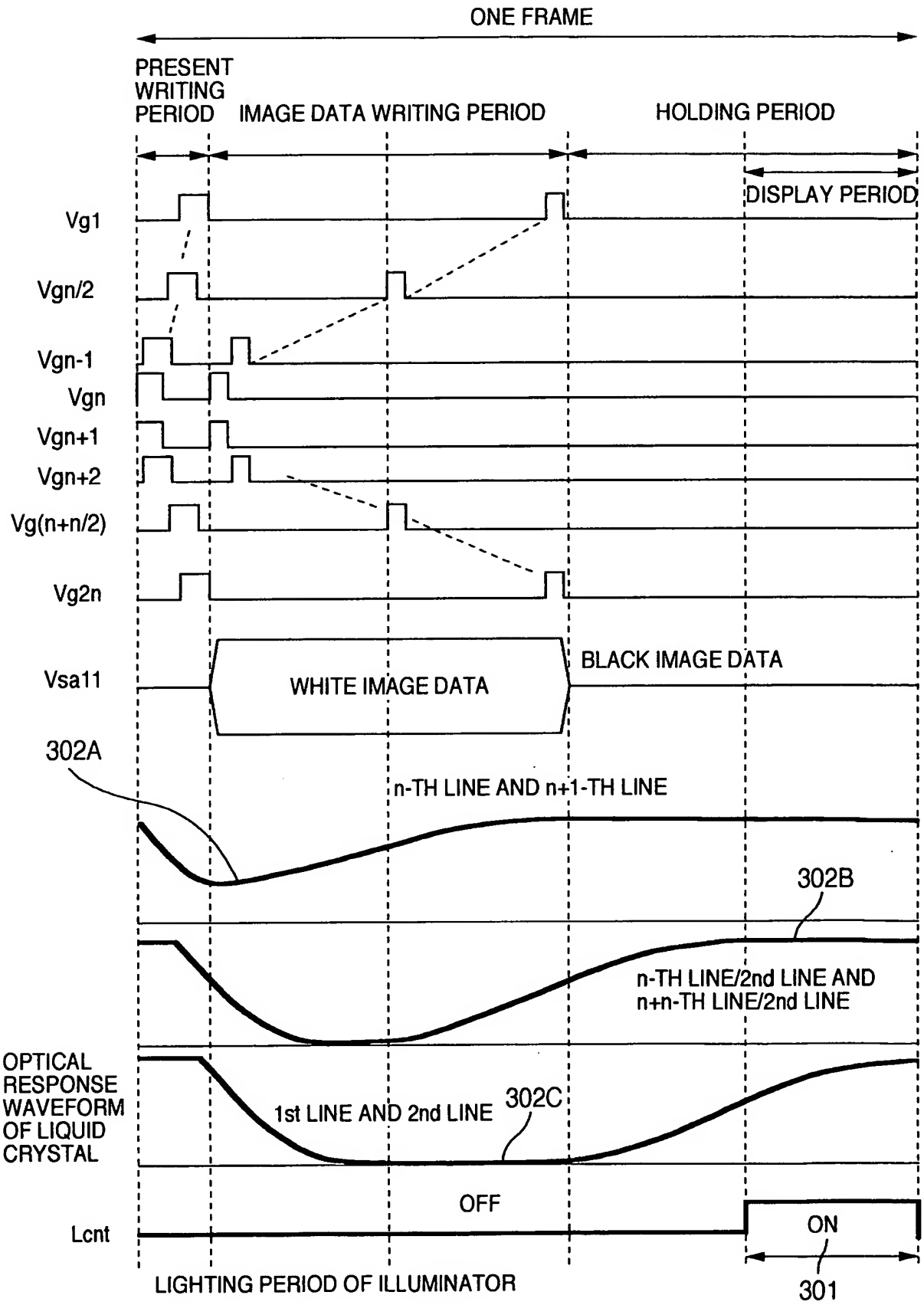

ONE FRAME
PRESENT WRITING PERIOD
IMAGE DATA WRITING PERIOD
HOLDING PERIOD
DISPLAY PERIOD
Vg1
Vgn/2
Vgn-1
Vgn
Vgn+1
Vgn+2
Vg(n+n/2)
Vg2n
Vsa11
WHITE IMAGE DATA
BLACK IMAGE DATA
302A
n-TH LINE AND n+1-TH LINE
302B
n-TH LINE/2nd LINE AND n+n-TH LINE/2nd LINE
OPTICAL RESPONSE WAVEFORM OF LIQUID CRYSTAL
1st LINE AND 2nd LINE
302C
OFF
ON
Lcnt
LIGHTING PERIOD OF ILLUMINATOR
301

FIG.14

MEMORY ADDRESS AND WRITTEN IMAGE SIGNAL

112 115

M(1,1)	M(1,2)	M(1,3)	M(1,4)	M(1,5)	M(1,6)	M(1,b)
D(1,1)	D(1,2)	D(1,3)	D(1,4)	D(1,5)	D(1,6)	D(1,b)
M(2,1)	M(2,2)	M(2,3)	M(2,4)	M(2,5)	M(2,6)	M(2,b)
D(2,1)	D(2,2)	D(2,3)	D(2,4)	D(2,5)	D(2,6)	D(2,b)
M(n,1)	M(n,2)	M(n,3)	M(n,4)	M(n,5)	M(n,6)	M(n,b)
D(n,1)	D(n,2)	D(n,3)	D(n,4)	D(n,5)	D(n,6)	D(n,b)
M(n+1,1)	M(n+1,2)	M(n+1,3)	M(n+1,4)	M(n+1,5)	M(n+1,6)	M(n+1,b)
D(n+1,1)	D(n+1,2)	D(n+1,3)	D(n+1,4)	D(n+1,5)	D(n+1,6)	D(n+1,b)
M(n+2,1)	M(n+2,2)	M(n+2,3)	M(n+2,4)	M(n+2,5)	M(n+2,6)	M(n+2,b)
D(n+2,1)	D(n+2,2)	D(n+2,3)	D(n+2,4)	D(n+2,5)	D(n+2,6)	D(n+2,b)
M(2n,1)	M(2n,2)	M(2n,3)	M(2n,4)	M(2n,5)	M(2n,6)	M(2n,b)
D(2n,1)	D(2n,2)	D(2n,3)	D(2n,4)	D(2n,5)	D(2n,6)	D(2n,b)

FIG.15

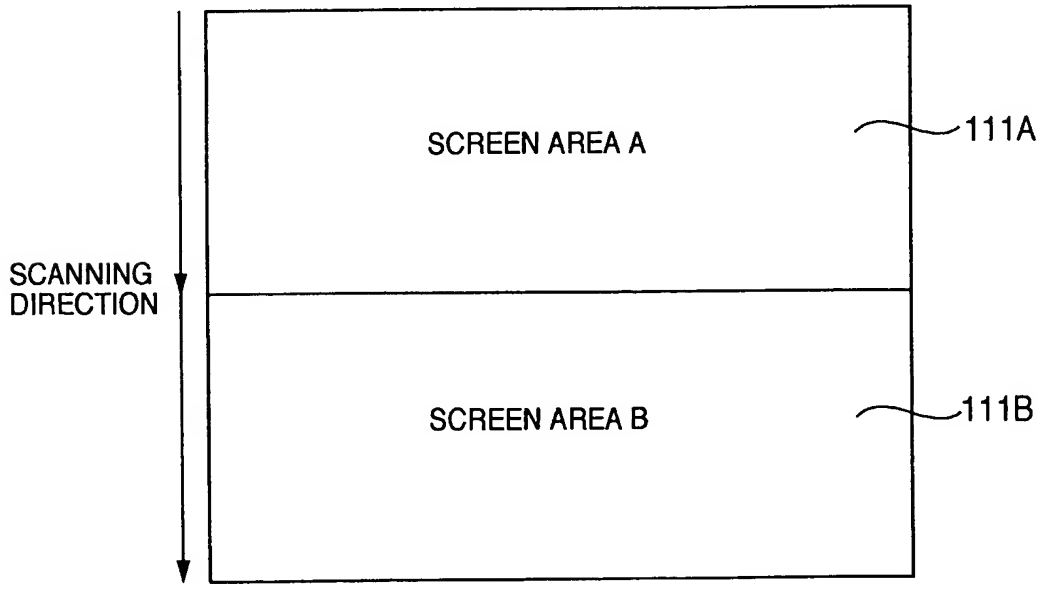


FIG.16

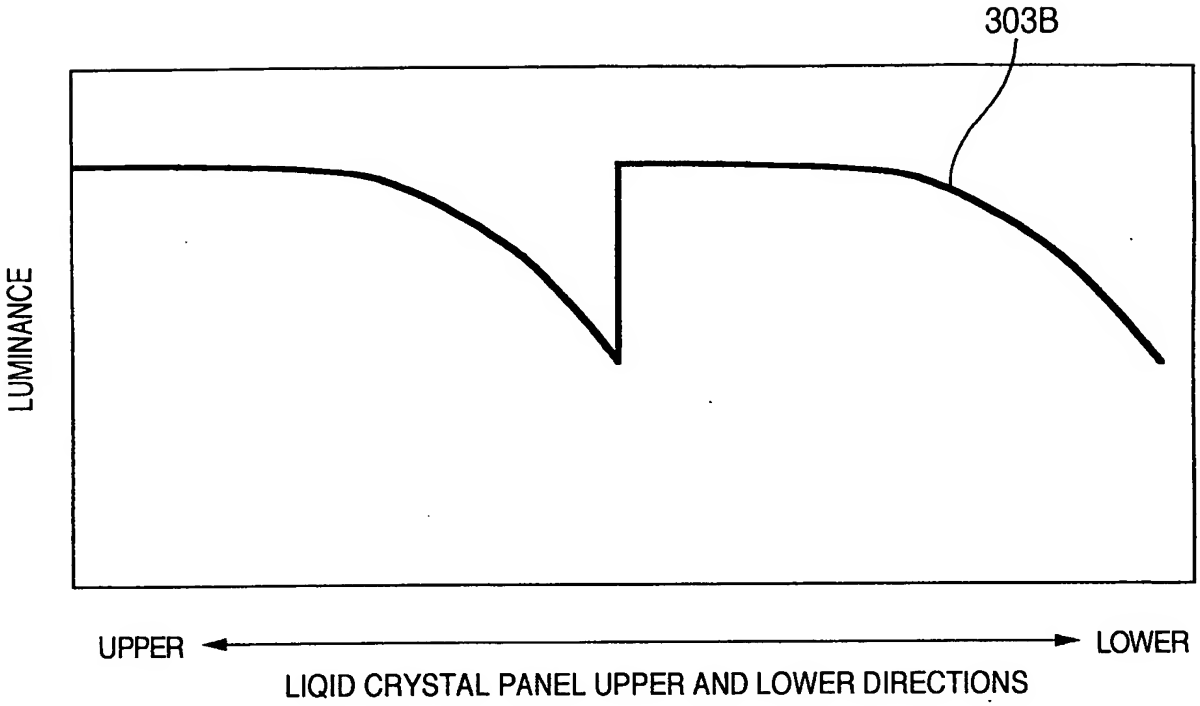

303B
LUMINANCE
UPPER
LOWER
LIQID CRYSTAL PANEL UPPER AND LOWER DIRECTIONS

FIG.17

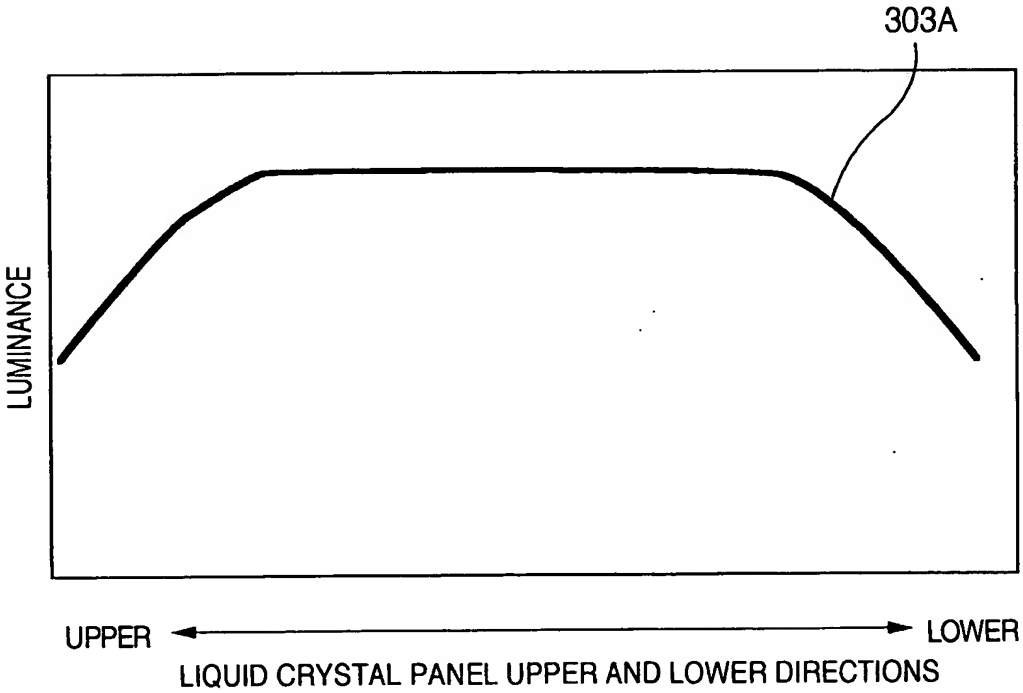

303A
LUMINANCE
UPPER
LOWER
LIQUID CRYSTAL PANEL UPPER AND LOWER DIRECTIONS

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FIG.18

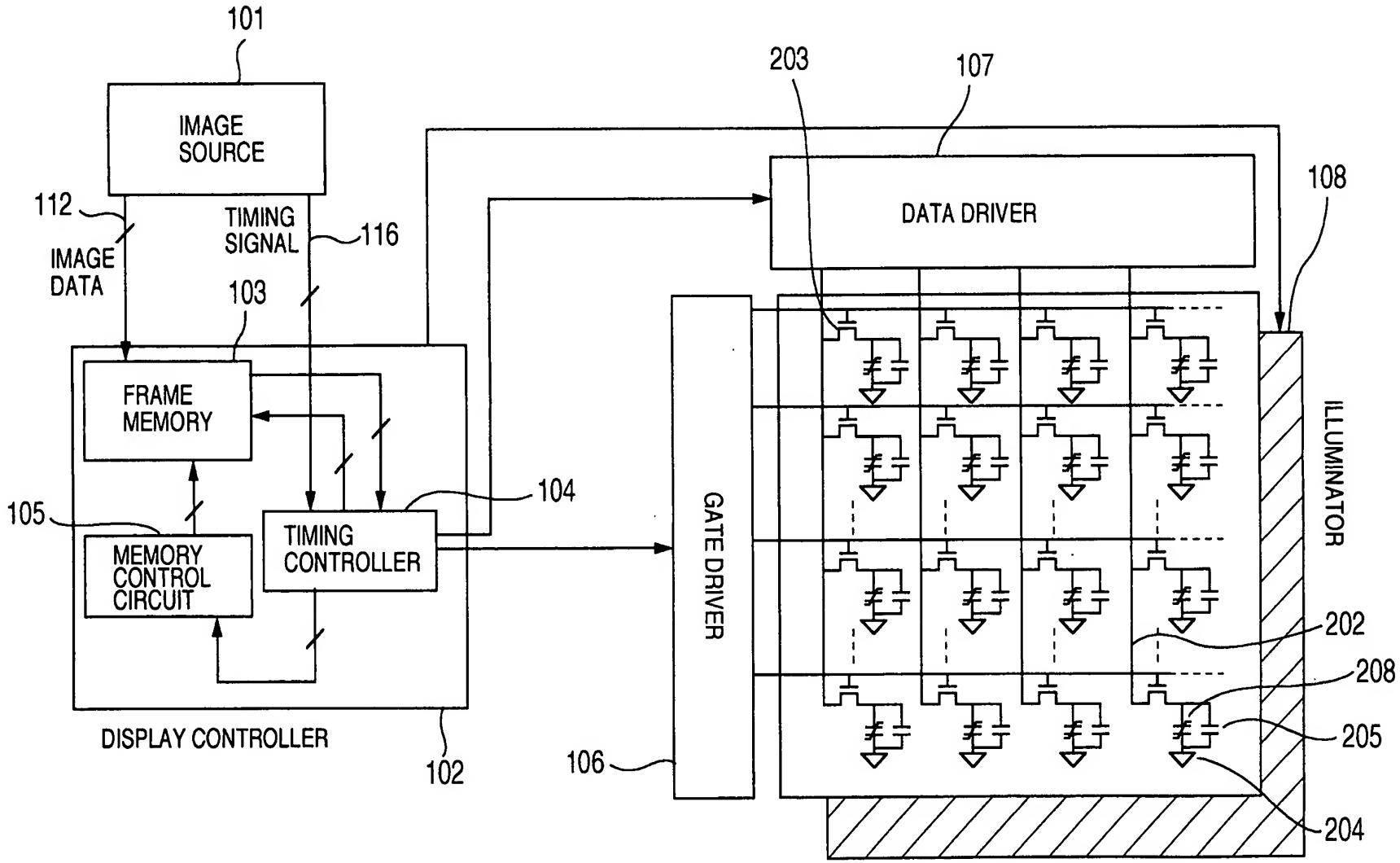


FIG.19

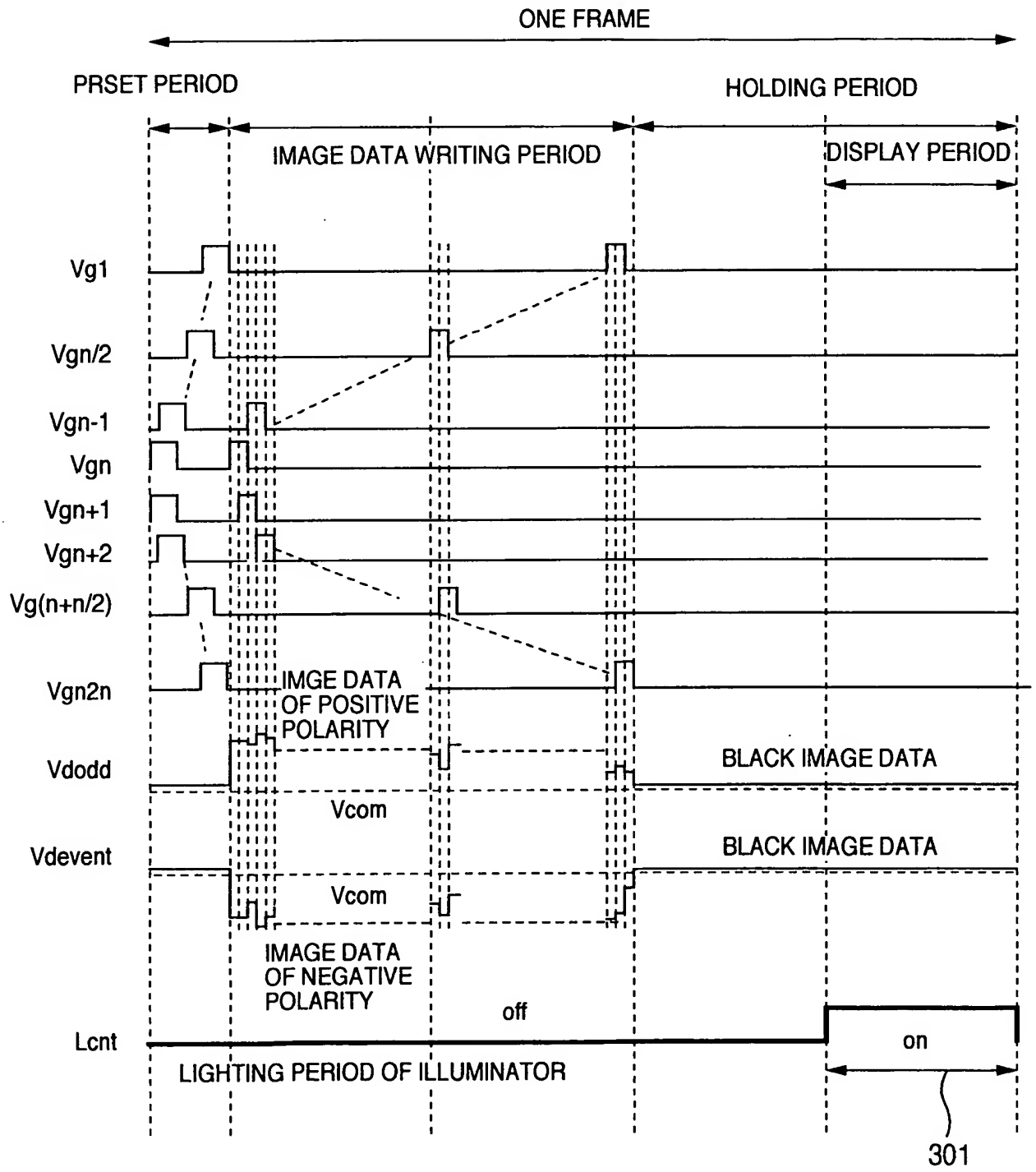

ONE FRAME
PRSET PERIOD
HOLDING PERIOD
IMAGE DATA WRITING PERIOD
DISPLAY PERIOD
Vg1
Vgn/2
Vgn-1
Vgn
Vgn+1
Vgn+2
Vg(n+n/2)
Vgn2n
IMGE DATA OF POSITIVE POLARITY
Vdodd
BLACK IMAGE DATA
Vcom
Vdevent
BLACK IMAGE DATA
Vcom
IMAGE DATA OF NEGATIVE POLARITY
off
Lcnt
on
LIGHTING PERIOD OF ILLUMINATOR
301

FIG.20

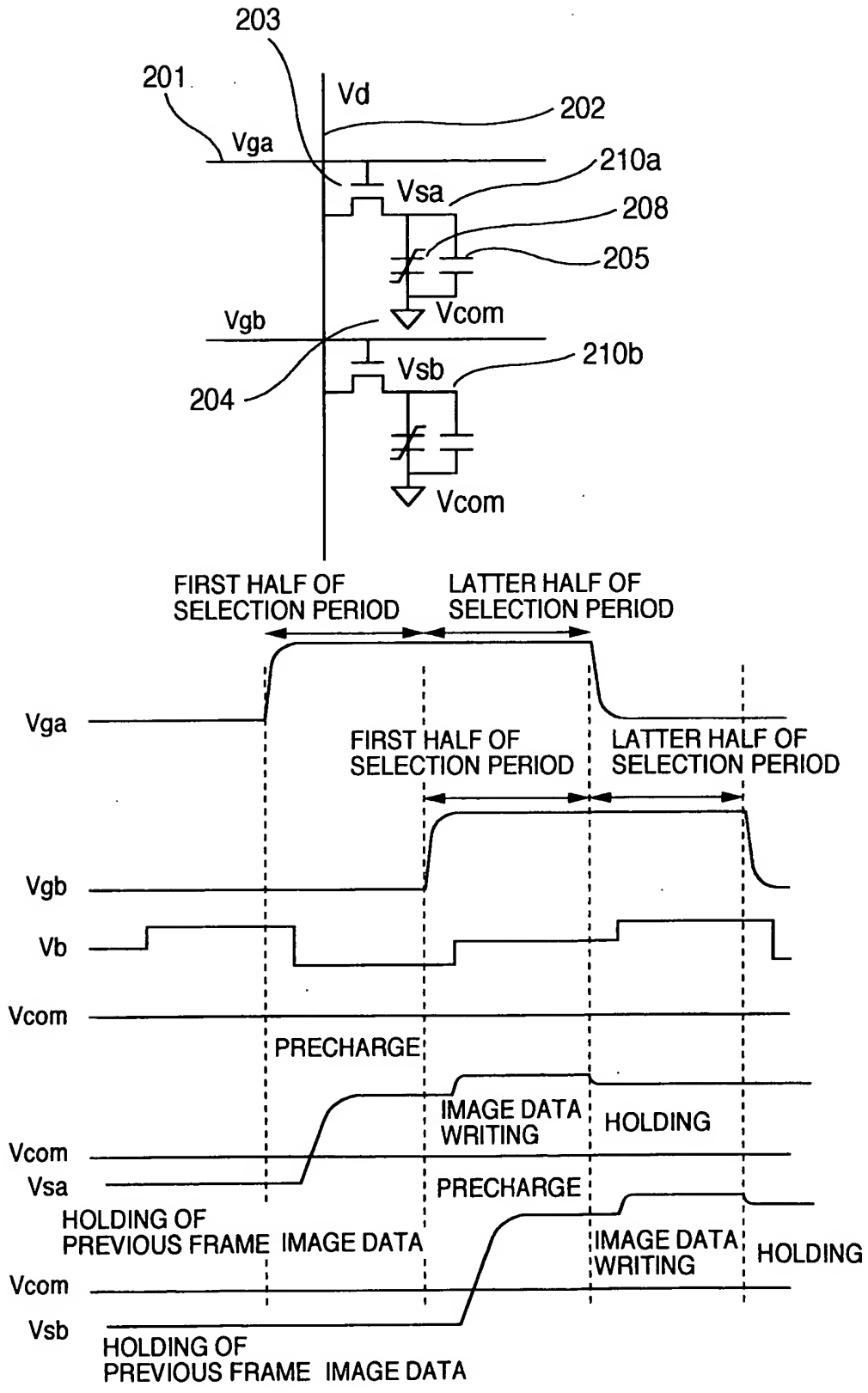
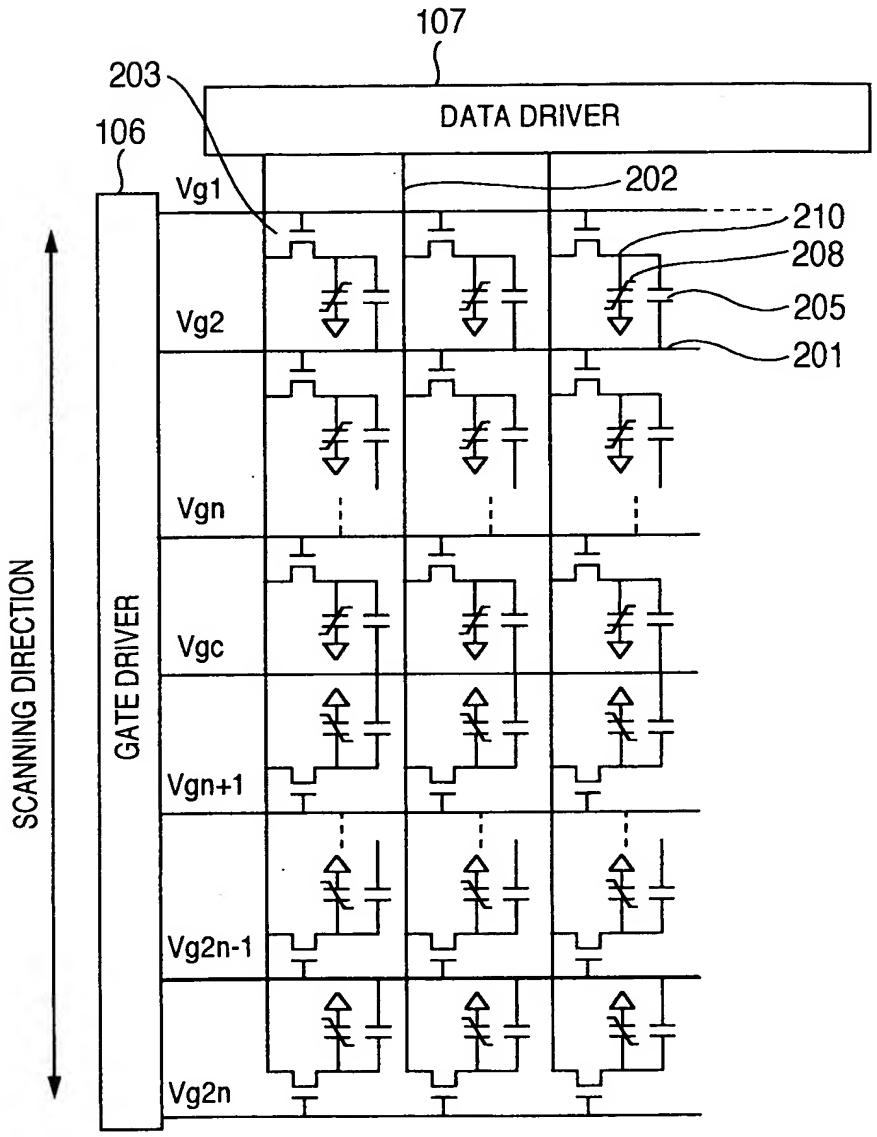

203
201
Vd
202
Vga
210a
Vsa
208
205
Vcom
Vgb
210b
Vsb
204
Vcom
FIRST HALF OF SELECTION PERIOD
LATTER HALF OF SELECTION PERIOD
Vga
FIRST HALF OF SELECTION PERIOD
LATTER HALF OF SELECTION PERIOD
Vgb
Vb
Vcom
PRECHARGE
IMAGE DATA WRITING
HOLDING
Vcom
Vsa
PRECHARGE
HOLDING OF PREVIOUS FRAME IMAGE DATA
IMAGE DATA WRITING
HOLDING
Vcom
Vsb
HOLDING OF PREVIOUS FRAME IMAGE DATA

FIG.21



2006130466600T

FIG.22

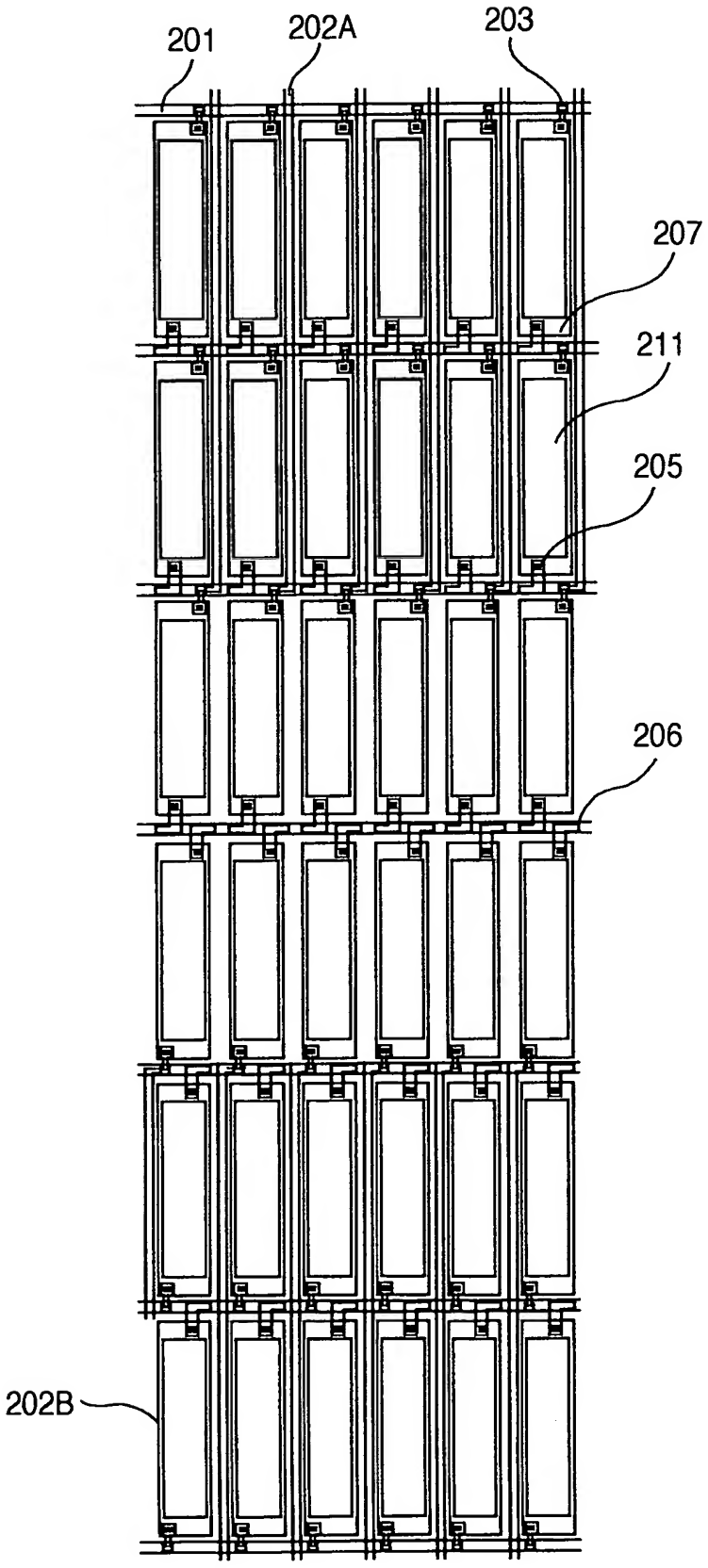


FIG.23

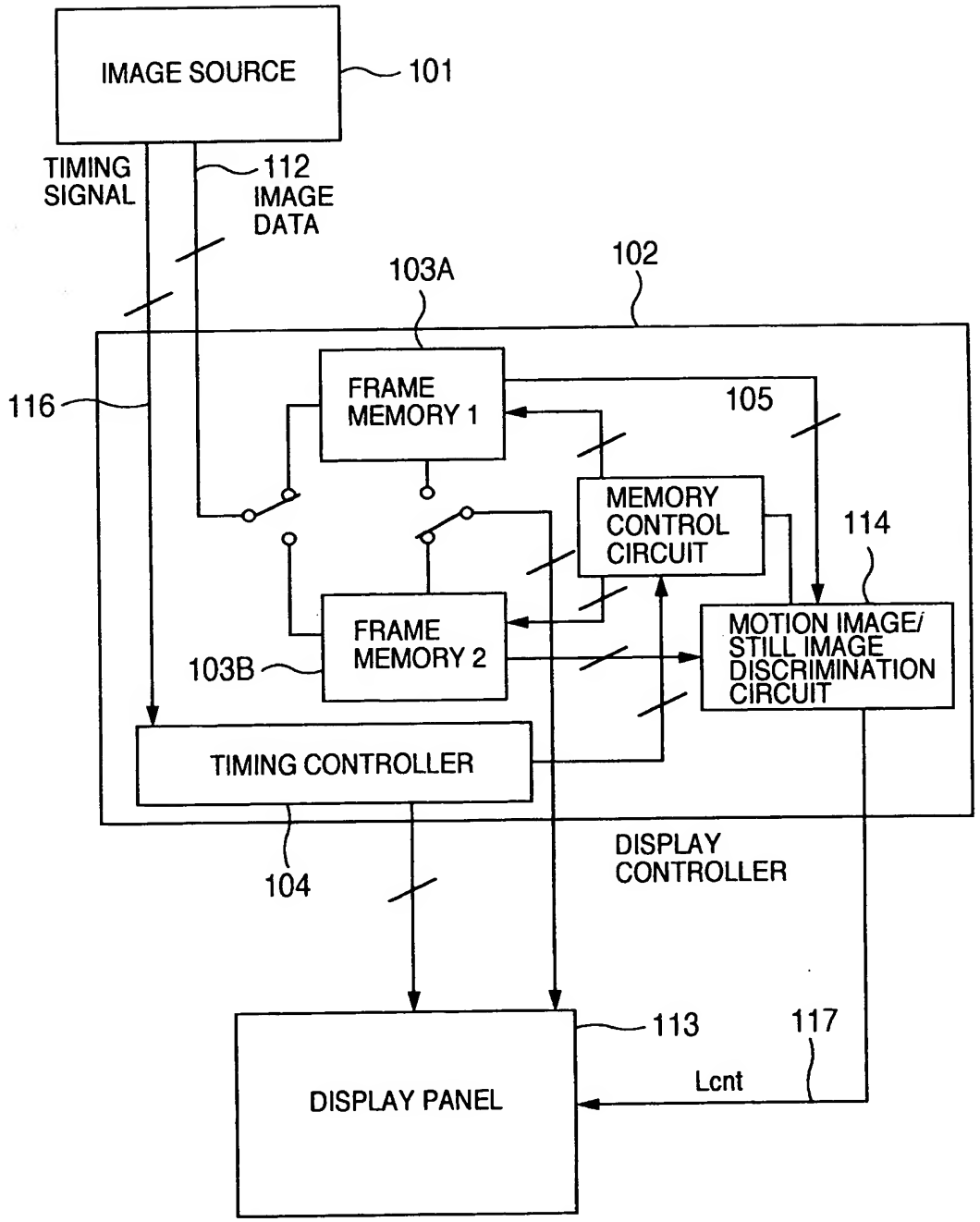


IMAGE SOURCE
101
TIMING SIGNAL
112
IMAGE DATA
103A
102
116
FRAME MEMORY 1
105
MEMORY CONTROL CIRCUIT
114
FRAME MEMORY 2
103B
MOTION IMAGE/ STILL IMAGE DISCRIMINATION CIRCUIT
TIMING CONTROLLER
104
DISPLAY CONTROLLER
113
117
Lcnt
DISPLAY PANEL

FIG.24

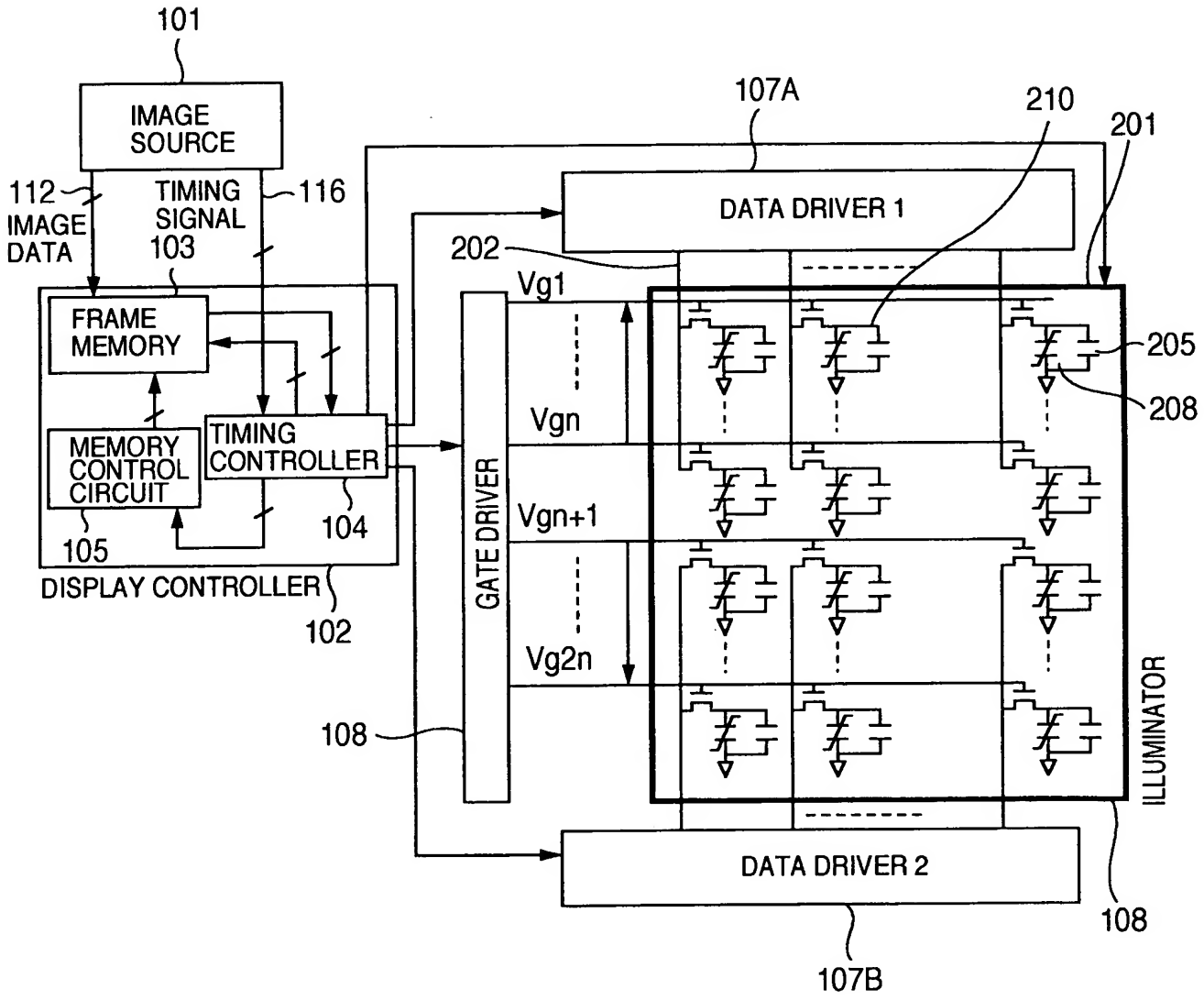

101
IMAGE SOURCE
112
IMAGE DATA
TIMING SIGNAL
103
116
FRAME MEMORY
MEMORY CONTROL CIRCUIT
105
TIMING CONTROLLER
104
DISPLAY CONTROLLER
102
107A
210
201
DATA DRIVER 1
202
Vg1
Vgn
Vgn+1
Vg2n
GATE DRIVER
205
208
108
ILLUMINATOR
DATA DRIVER 2
108
107B

FIG.25

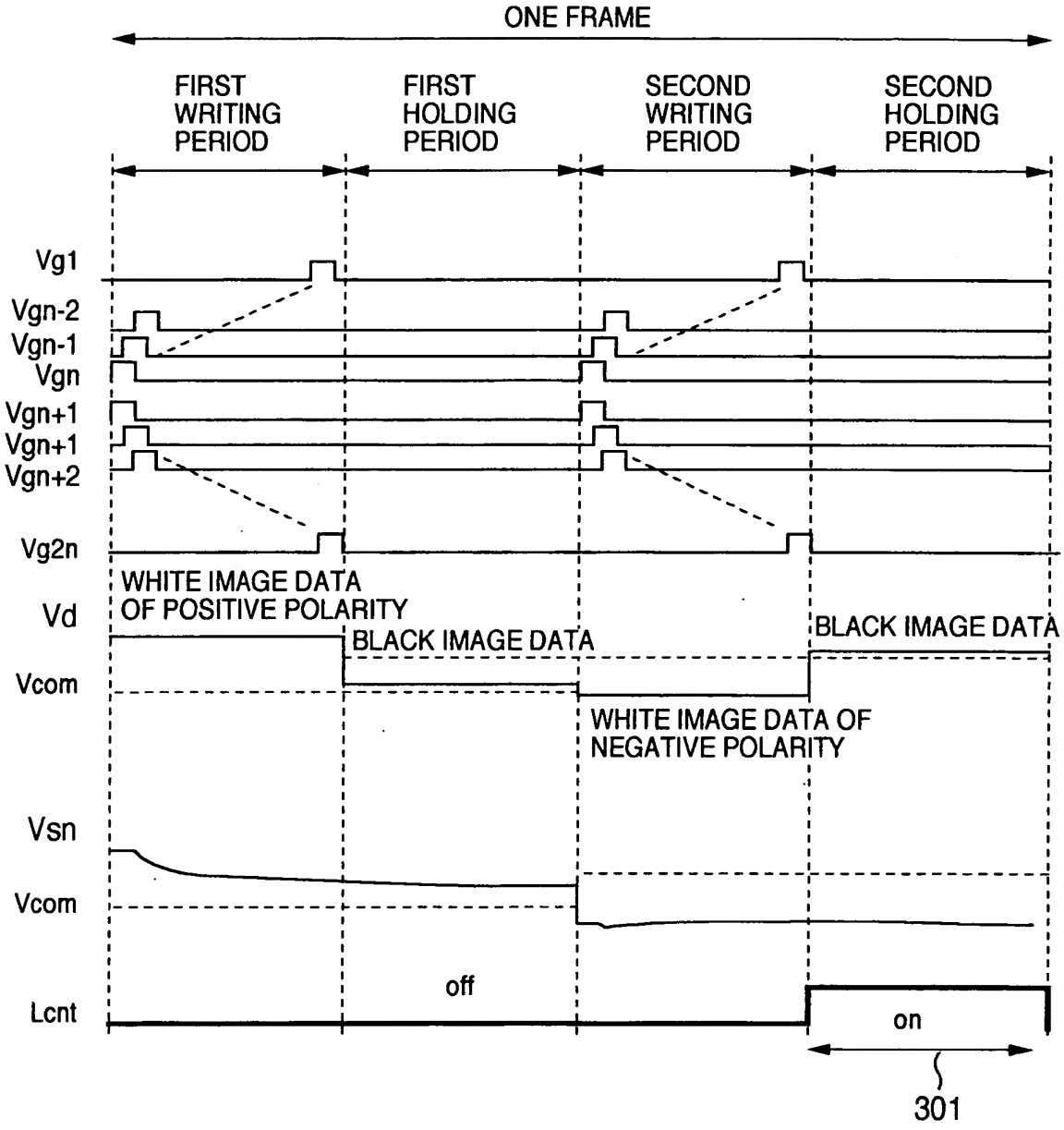

ONE FRAME
FIRST WRITING PERIOD
FIRST HOLDING PERIOD
SECOND WRITING PERIOD
SECOND HOLDING PERIOD
Vg1
Vgn-2
Vgn-1
Vgn
Vgn+1
Vgn+1
Vgn+2
Vg2n
Vd
WHITE IMAGE DATA OF POSITIVE POLARITY
BLACK IMAGE DATA
BLACK IMAGE DATA
Vcom
WHITE IMAGE DATA OF NEGATIVE POLARITY
Vsn
Vcom
Lcnt
off
on
301

FIG.26

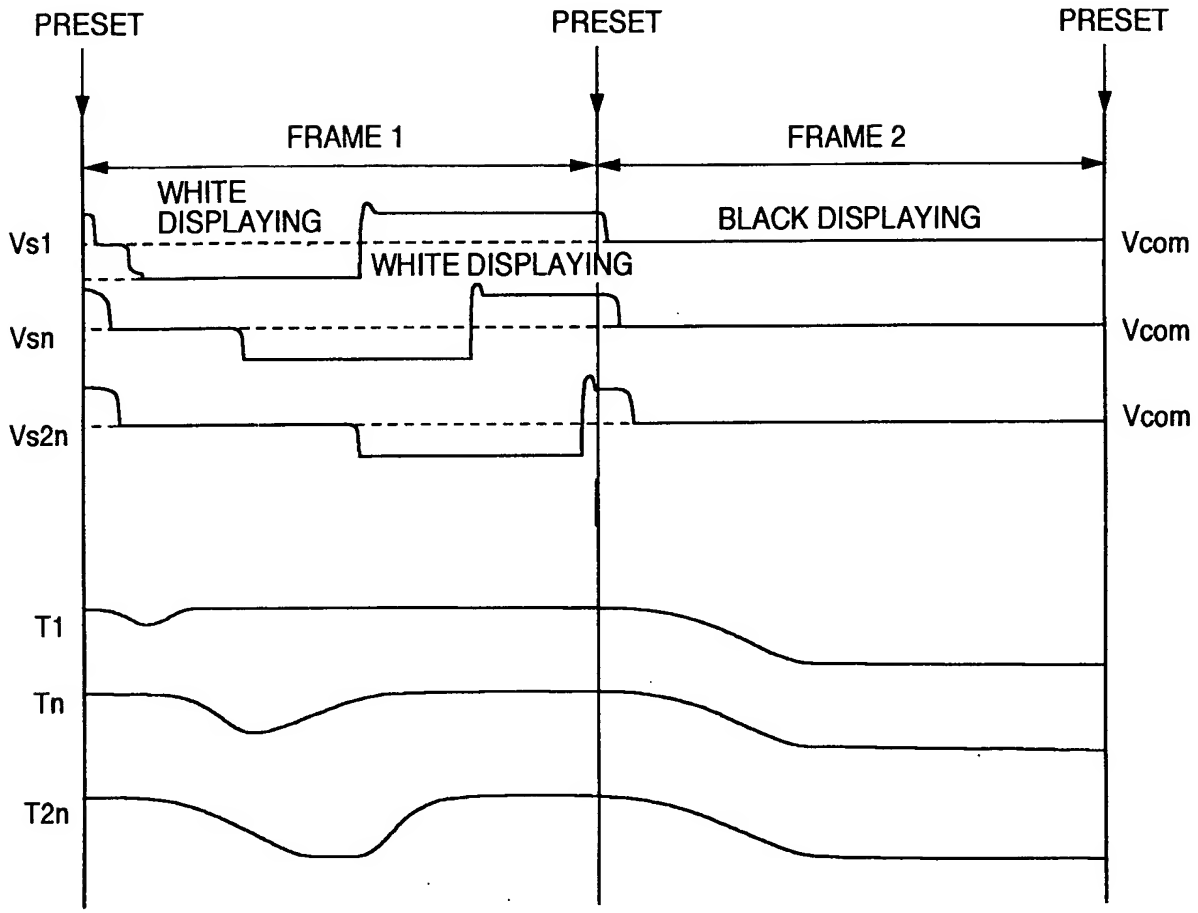

PRESET
PRESET
PRESET
FRAME 1
FRAME 2
WHITE DISPLAYING
BLACK DISPLAYING
WHITE DISPLAYING
Vs1
Vsn
Vs2n
Vcom
Vcom
Vcom
T1
Tn
T2n

FIG.27A

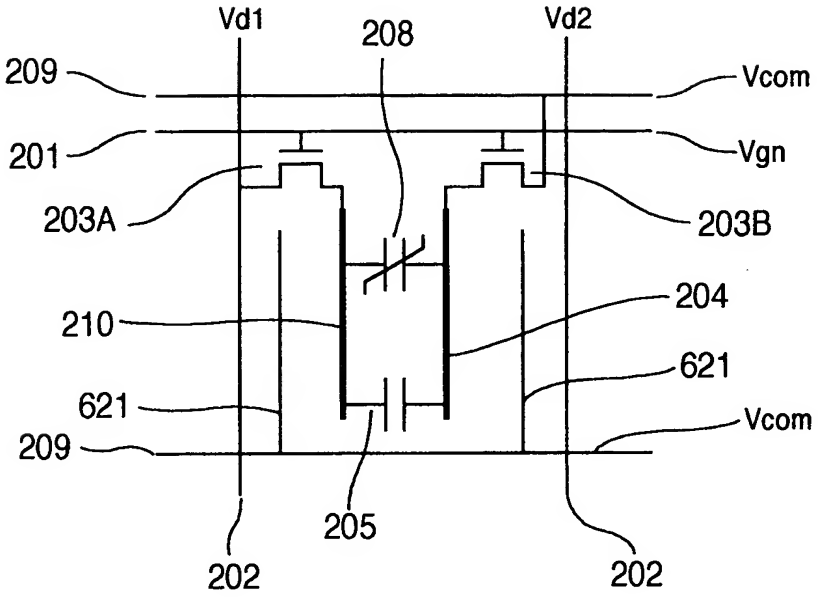


FIG.27B

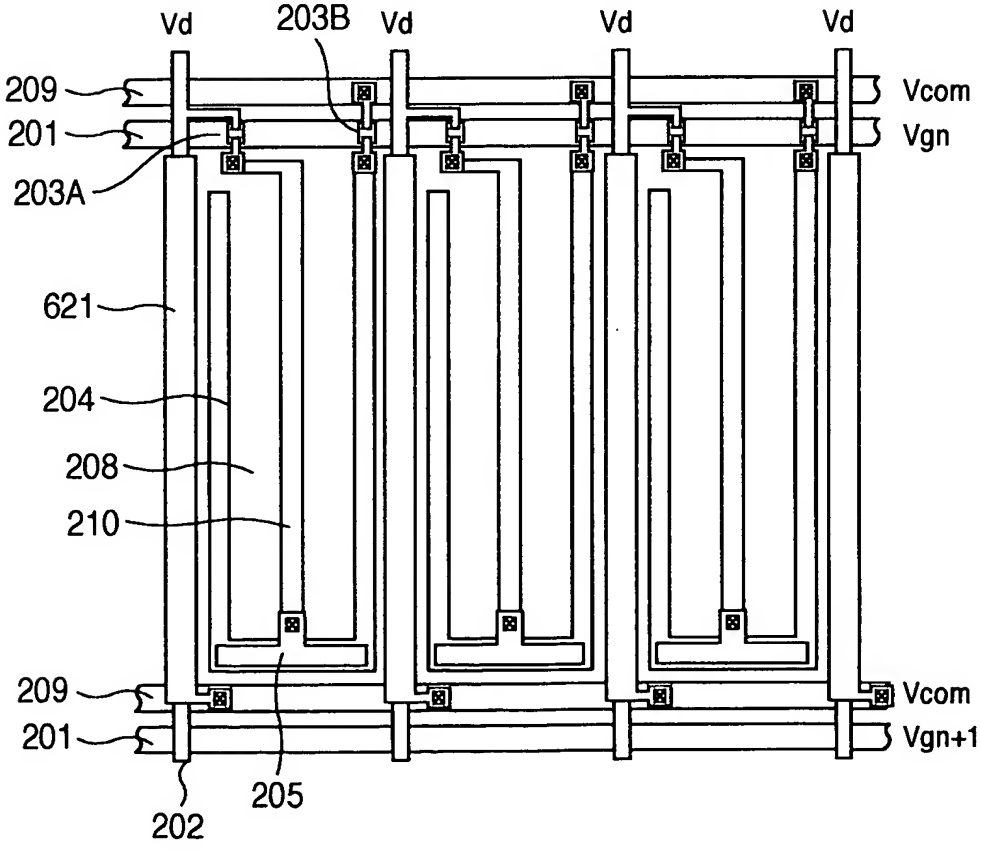


FIG.28A

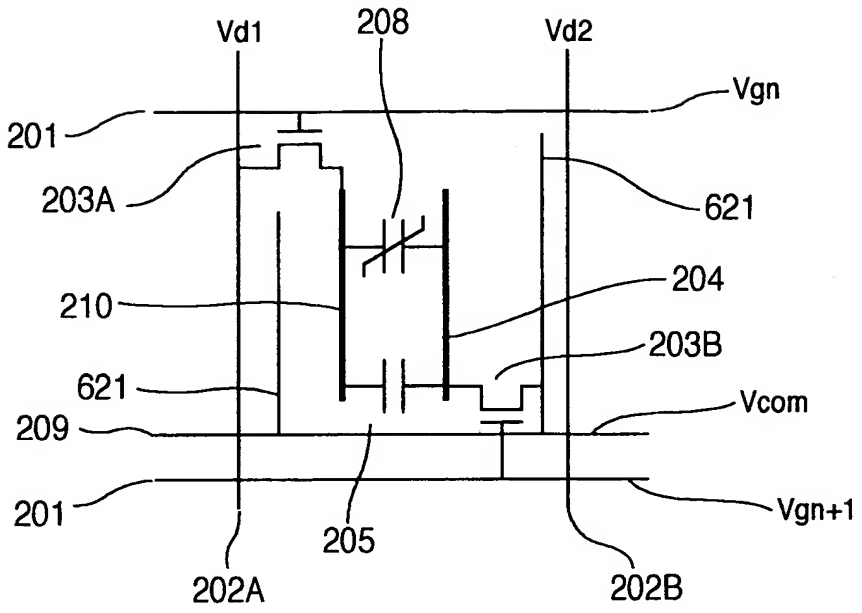


FIG.28B

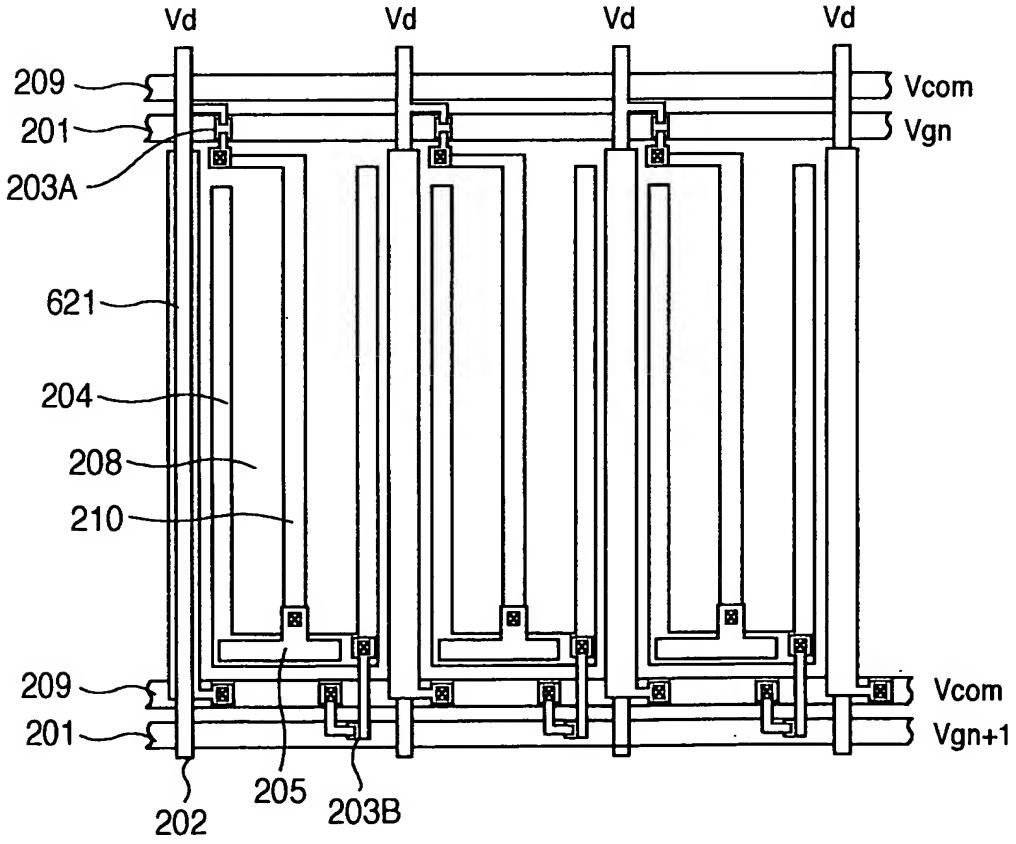


FIG.29

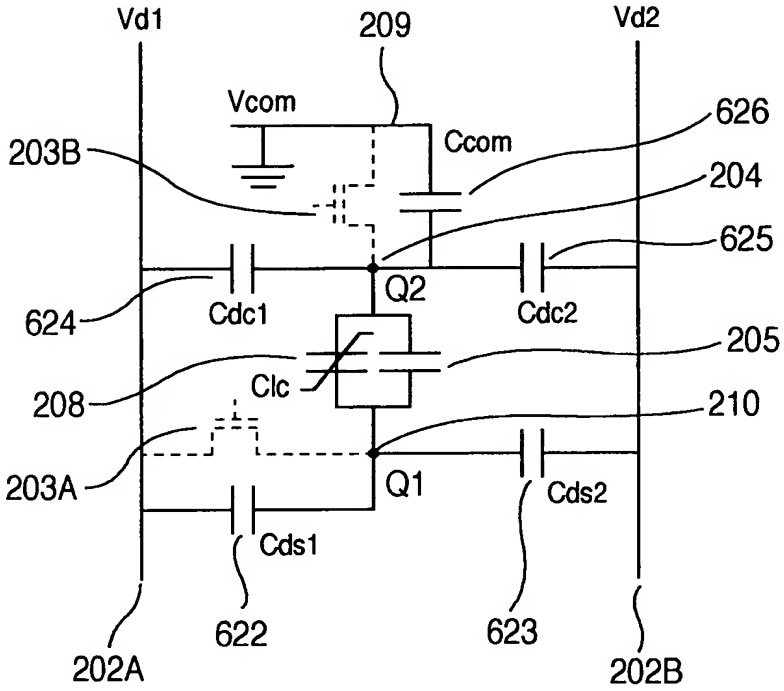


FIG.30

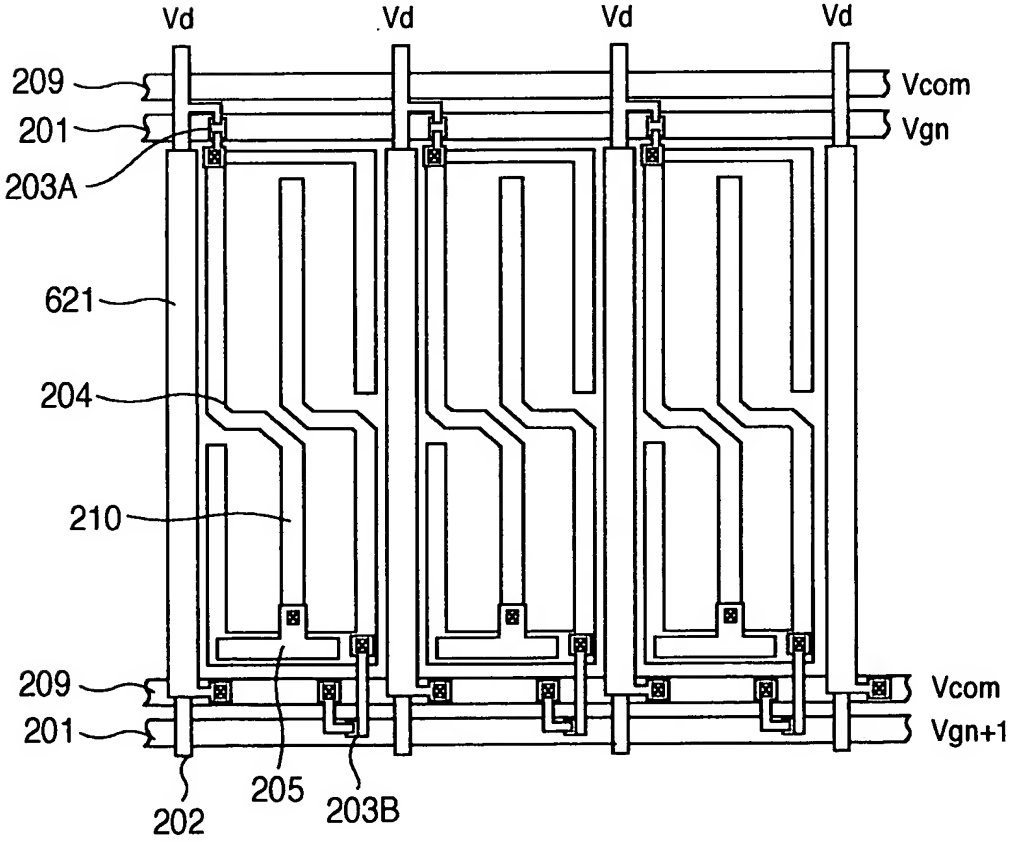


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FIG.31

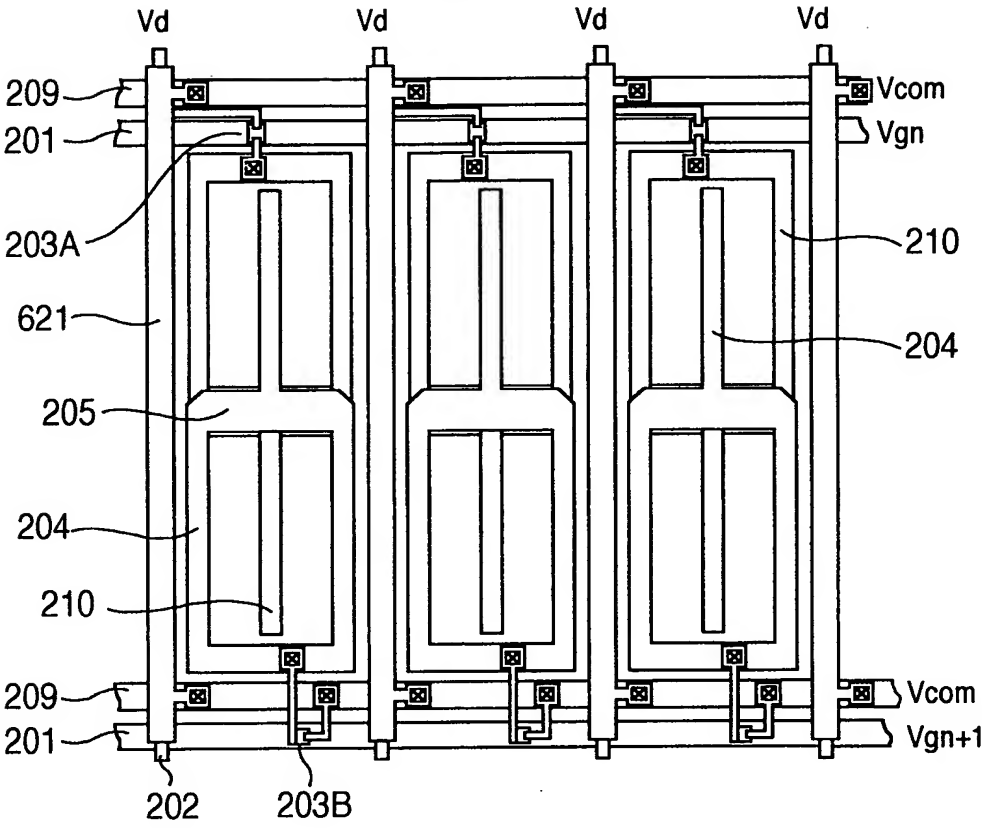

Vd
Vd
Vd
Vd
209
201
203A
621
205
204
210
209
201
202
203B
Vcom
Vgn
210
204
Vcom
Vgn+1

FIG.32

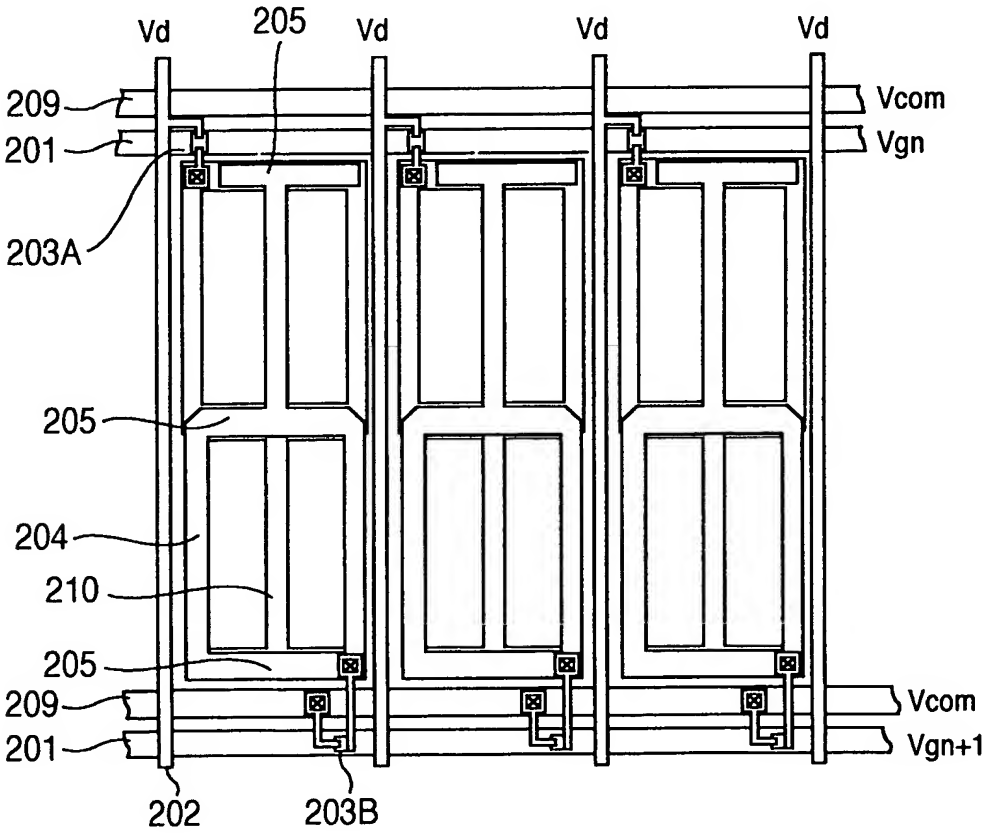

Vd
205
Vd
Vd
Vd
209
201
203A
205
204
210
205
209
201
202
203B
Vcom
Vgn
Vcom
Vgn+1

FIG.33

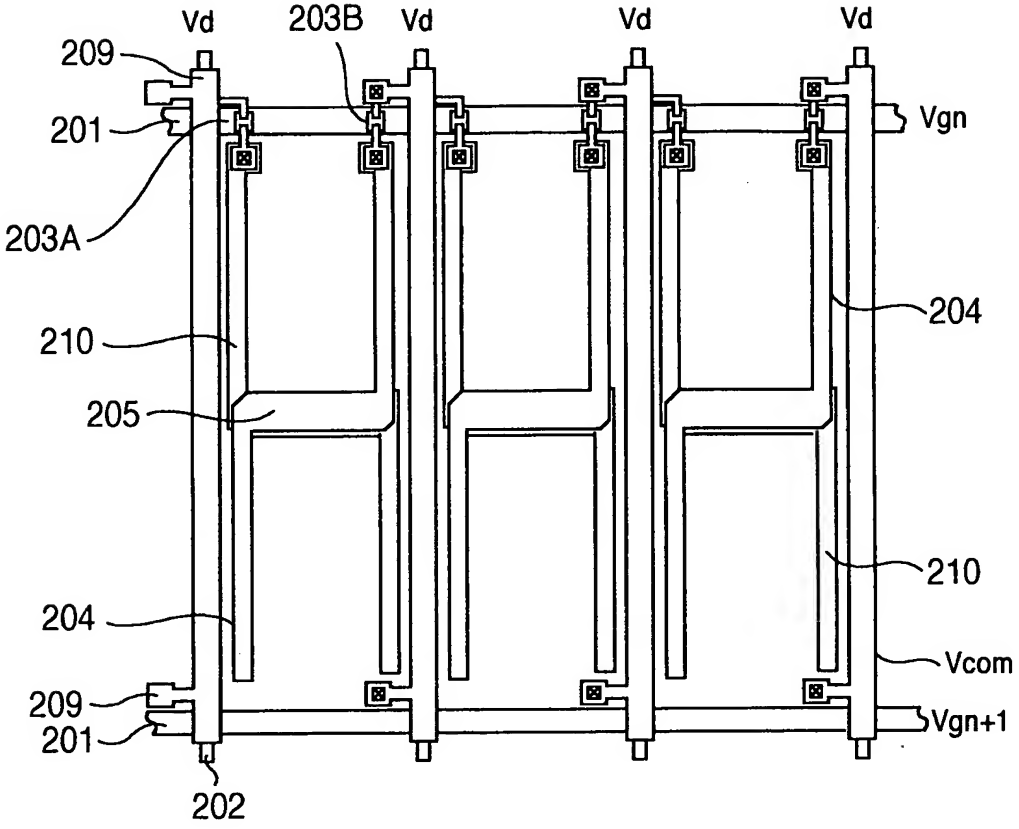
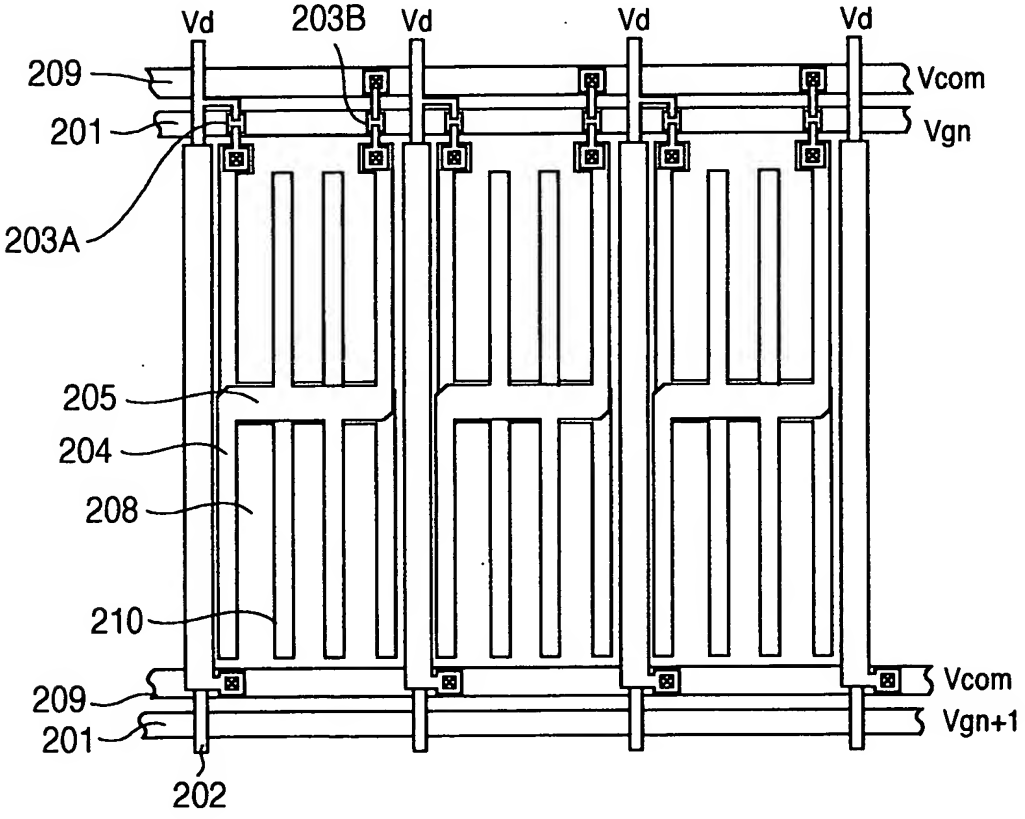

Vd
203B
Vd
Vd
Vd
209
201
203A
210
205
204
209
201
202
Vgn
204
210
Vcom
Vgn+1

FIG.34


Vd
203B
Vd
Vd
Vd
209
201
203A
205
204
208
210
209
201
202
Vcom
Vgn
Vcom
Vgn+1